

MARINE REVIEW.

VOL. XV.

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No. 1.

A Seaboard Outlet in the Next Century.

Mr. B. L. Pennington, vessel owner of Cleveland, presented a brief but very interesting paper on "The Evolution of Lake Commerce," at a recent meeting of the Ohio State Board of Commerce. Alike to a great many other practical men of the lakes, he is of the opinion that the present generation will not see lake freight ships crossing the Atlantic. On this score he says:

"The project of a ship canal connecting the lakes with tide water has become one of general and increasing interest. Although fearing it might prove injurious to the lake business through the ingress of ocean tonnage, I yet feel that a broad and unselfish policy, in the long run, is the better one, bringing, as it will, the greatest good to the greatest number. I have endeavored to show, among other things, the benefit of cheapened lake freights to agriculture. With the price of grain fixed at Liverpool, it is manifest that every cent saved in transportation thither and in handling, from the time it leaves the granary of the western farmer, is added to the price he receives. So, as cheapened lake transportation has already largely benefited him, it is obvious that could grain be consigned from lake ports direct to Liverpool, without breaking bulk, saving the cost of extra handling and commission, besides delays, a still further gain would accrue to the producer. The United States government should construct this waterway, as a project so gigantic and costly by private enterprise, necessitating tolls well nigh prohibitory, would not materially benefit the American producer. After construction the government could turn it over to the state or states through which it extends to maintain and operate it free of tolls to all traffic. But no vessel owner now living, in my opinion, will ever be affected by its competition. I believe, however, that this, the most brilliant conception of the nineteenth century, will materialize in the twentieth. Such a mammoth enterprise will necessarily consume much time in construction; meanwhile a minority of the existing lake tonnage can possibly be adapted, and new tonnage constructed, to meet the necessities of deep sea navigation. Thus would the remodelled lake marine, with its deep channel outlet, competent to successfully cope with the peculiar dangers and limitations of lake navigation as well as to brave the ocean tempest, achieve its most conspicuous evolution."

The Vulcan Coal Co., recently organized in Cleveland, will very probably cut quite a figure in the lake coal trade, when its mine is in full operation. The company is capitalized at \$120,000, and the officers are Calvin Morris, president and treasurer; Loftus Cuddy, vice-president, and Martin Mullen, secretary. Of the capital of \$120,000, one-half is applied on the coal lands, which comprise 631 acres in the Panhandle district, and the other half will be used for machinery that is to be put in at once, as a shaft has already been sunk. It is expected that the mine will produce 750 tons a day next year and probably 1,200 tons daily in the following year. The coal will be moved to Cleveland over the Pennsylvania road and shipped from the harbor-front dock of the Cuddy-Mullen company.

Grain shovelers at Buffalo who have been discontented with the contract system inaugurated some time ago by the Lake Carriers' Association are talking of putting in a bid to the elevators for handling the business next season. It is not probable, however, that they can attach stability enough to their bid to cause any attention to be paid to it. But in this connection it may be noted that there are a great many vessel owners who are decidedly of the opinion that some plan must soon be adopted to secure a further reduction in grain handling charges at Buffalo; not through lower wages but through the elevator owners.

John Gordon of Buffalo is said to be again planning for the purchase or charter of two or three steamers to be operated in the package freight trade in connection with his steel steamer *Globe*. He is quoted as saying that the *Globe* will not be the only vessel that he will have next season.

Association of Masters and Pilots.

Another organization in which the men who sail lake vessels are interested will hold its annual convention in Washington during the coming month. The grand harbor of the American Association of Masters and Pilots will convene at the capitol on Jan. 25, and it is expected that delegates will attend from the several local harbors that have recently been organized on the lakes. In addition to its beneficial features this organization aims to look after the interests of its members in legislative matters at Washington and in dealings with departments of the government that have supervision over government matters. Grand Secretary F. B. Perkins, who has been on the lakes for several weeks past, has just completed details leading up to the organization of a harbor in Detroit.

Toledo harbor No. 43, which was organized in April last with twenty-four charter members, now has thirty-five members. Officers of this harbor who have just been elected are: Albert S. Fitts, captain; John J. Cunningham, first pilot; Homer Durand, second pilot; Geo. E. Hardy, captain's clerk, purser and purser's clerk. Appointive officers are: Chaplain, Edward A. Williams; starboard quartermasters, John Dunseith and Geo. W. Disbrow; port quartermasters, Chas. P. Sherbuo and Wallace King; saloon watchmen, Harry Tyrie; forward deck watchman, Edward R. McNutt; trustees, E. A. Williams, John Dunseith and Geo. E. Hardy.

The Cleveland harbor will elect officers at a meeting to be held next Tuesday evening, when it is expected the grand secretary will be with them.

Buffalo's Enormous Receipts of Grain.

Although corrected figures may make some unimportant changes in statistics relative to receipts of grain at Buffalo during 1896, it is now certain that the total receipts of grain, including flour as wheat, will be very close to 215,000,000 bushels, and there is to be added to this about 9,000,000 bushels of flax seed. Figures given out a few days ago make the total grain and flour receipts 214,878,284 bushels, against 162,988,842 bushels in 1895, 160,968,095 in 1894, 187,235,160 in 1893 and 181,899,464 in 1892. The 1896 receipts were divided as follows: Wheat, 54,159,183 bushels; corn, 47,670,537 bushels; oats, 39,973,512 bushels; barley, 16,787,285 bushels; flour, 10,365,192 barrels.

Buffalo certainly has reason to feel proud of this record, especially as receipts in other lines included about 202,000,000 feet of lumber, 104,000,000 shingles, 2,000,000 sacks of feed and large quantities of other mill products, as well as nearly half a million tons of iron ore.

Shipments by lake include 2,400,000 tons of coal, 1,205,000 barrels of sugar and 1,300,000 barrels of salt and cement.

Capt. William Logie, who died at his home in Cleveland Sunday had been interested in harbor tugs for a great number of years. He was a director in the Vessel Owners Towing Co., having been connected with that concern since its organization. Capt. Logie was one of a large class of men who in years past on the lakes managed, by thrift and frugality, to put aside a small part of their earnings, which was invariably invested in vessel property. His earnings went into tugs, and although he was not wealthy, his latter years were more comfortably spent than most men whose opportunities were similar to those which he met with. He was unassuming and gentlemanly in character. Death was caused by apoplexy. He was sixty-seven years of age.

On new revenue cutters like the *Gresham*, built recently by the Globe Iron Works Co., Cleveland, the salary list alone will approximate \$48,000 a year. The two new lake cutters, for which bids will be asked in a week or two, will be even more costly than the *Gresham*.

Terms attending the lease of the big Mountain Iron mine from John D. Rockefeller to the Carnegie Steel Co. are said to include the payment of \$600,000 bonus and 25 cents a ton royalty.

Rockefeller Vessel at Wheeler's Yard

A very good description of the steel tow barge building at F. W. Wheeler & Co.'s yard for the Bessemer Steamship Co. of Cleveland as just been prepared by Mr. Anderson, who is in charge of the West Bay City works. The vessel will be 380 feet long over all, 366 feet between perpendiculars, 44 feet beam molded and 26 feet depth, with a carrying capacity of 3,950 gross tons on a draft of 14 feet 6 inches. She will have main deck beams, but no laid deck, except at forward and after ends; spar deck complete, and forecastle deck forward arranged with a steel house for towing machinery. All accommodations for officers will be in a steel deck house aft. There will be eleven hatches for handling cargo, 24 feet between centers, and three steel spars with four sails, schooner rigged. The double bottom will be 4 feet 6 inches deep, built with cross floors of flanged plates, on top of which will be three longitudinals on each side of center keelson supporting the inner bottom. The double bottom will be divided by solid water-tight floors and center keelson into six water-tight compartments for water ballast, and drain and filling pipes will have suitable gear from drain valves to spar deck, so that each compartment can be filled or emptied as the officer of the deck requires. Collision bulkheads forward and aft in the ship will extend

sary pumps for water ballast, steam and fire service, an American Ship Windlass Co.'s towing machine with a 1½-inch wire rope hawser forward and an electric plant of sufficient capacity to light all cabins, cargo holds and decks. The donkey boiler will be located forward under the forecastle, with the uptake leading into the foremast, which in this case, being of steel, will be utilized as a funnel.

In General.

An editorial in the January Review of Reviews favors a permanent census bureau.

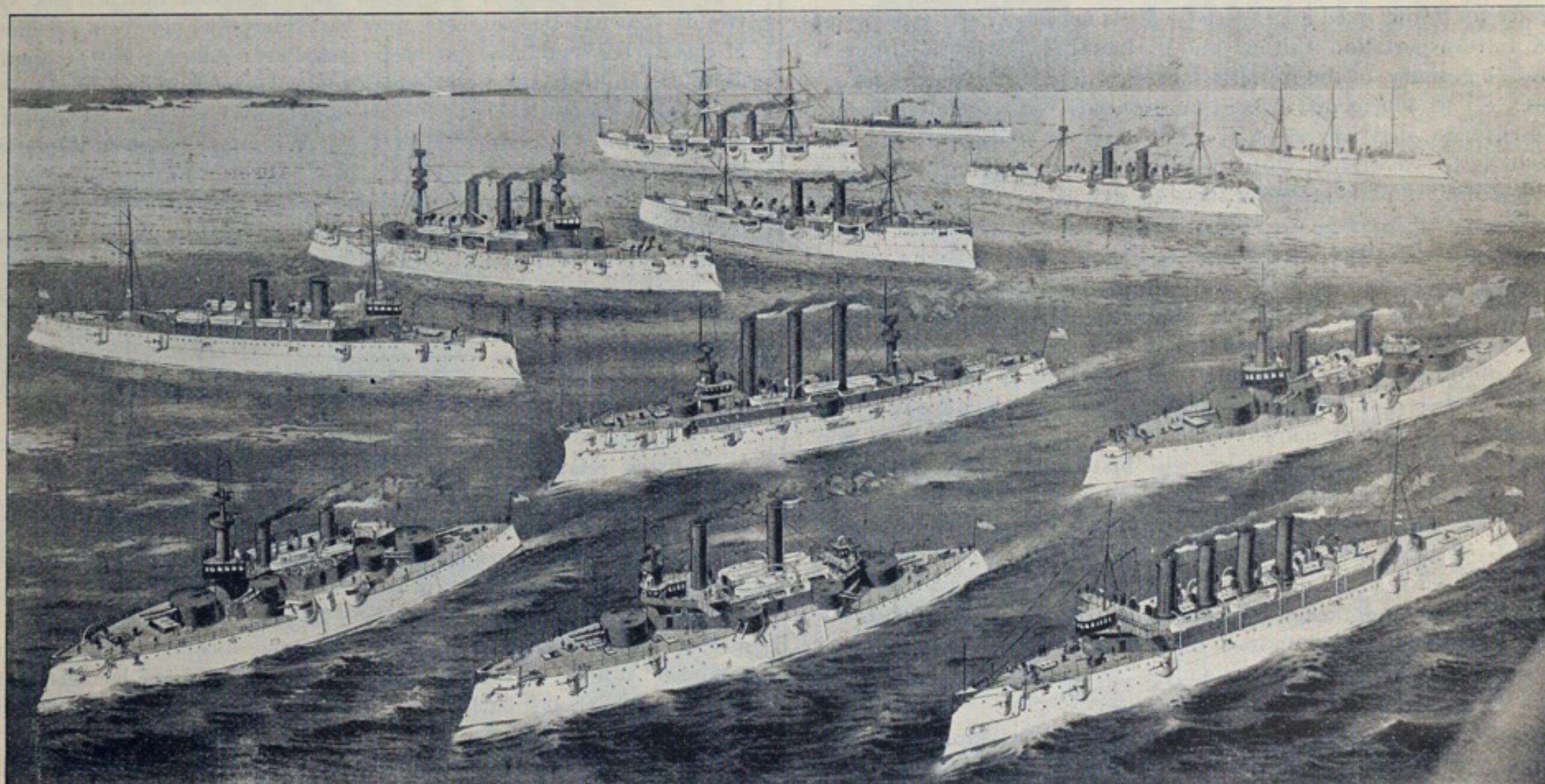
J. K. Brice of Lima, O., brother of the Ohio senator, will command the naval reserve of the state.

No change was made in officers or directors of the Carnegie Steel Co. at its annual meeting in Pittsburg last week.

The Old Dominion Steamship Co., one of the best of the Atlantic coast lines, is now paying its forty-second dividend.

A reduction of \$3 a ton in steel rails, making the prices \$25 at mills in the east and central west and \$26 at Chicago, was made by the manufacturers at their meeting in New York last week.

In his annual report Secretary Carlisle asks for an appropriation of \$100,000 for examinations and surveys of rivers and harbors in the



Built by The Wm. Cramp & Sons Ship and Engine Building Co., Philadelphia, Pa.

TWELVE SHIPS OF THE NEW UNITED STATES NAVY.

Minneapolis.

Indiana.

New York.

Philadelphia.

Newark.
Brooklyn.
Iowa.

Vesuvius.

Baltimore.

Yorktown.
Massachusetts.
Columbia.

From Blue Book of American Shipping.

up to spar deck, and the hold will be divided into three compartments by two screen bulkheads, also extending to spar deck. All frames will be of Z section and beams and stanchions of E section. All plating is to be of open hearth mild steel, tested to the following specifications: Tensile strength not less than 54,000 nor more than 62,000 pounds per square inch; limit of phosphorus not to exceed 0.08; elongation not to be less than 24 per cent. in 8 inches and reduction not less than 45 per cent. Reports of tests to be furnished and plates not to run over or under theoretical weight more than 2½ per cent. All furnace-shaped sections to be of open hearth, and all other shapes to be of Bessemer steel. Rivets to be of best open hearth steel, limit of phosphorus 0.06, of sulphur 0.06 and tensile strength not less than 52,000 nor more than 60,000 pounds per square inch. Materials to be tested at maker's works to these requirements by a disinterested party representing both steel maker and ship builder. Special care is given in the specifications to all and every detail entering into equipment and outfit of this vessel, and all these matters will be carefully looked after by the representative of the owners, Robert Logan, naval architect of Cleveland. The vessel will have a Williamson steam steering engine, deck hoist amidships, a Providence steam windlass and capstan forward, reversible capstans aft as well as amidships, two stockless 3,500-pound anchors forward, one 1,200-pound stockless kedge anchor aft, neces-

lake sytem. It is the intention, very porbably, to use a large part of this appropriation, if it is secured, in obtaining information regarding the outflow of the lakes, so as to submit a report along lines suggested by the Chicago drainage canal scare.

A statement of depths of mining shafts recently published in England shows that the Red Jacket shaft of the Calumet & Hecla mine in the Lake Superior copper region, which is practically 5,000 feet deep, is by far the deepest mine shaft in the world. At the present time the deepest shaft in the United Kingdom is that of the Ashton Moss colliery, near Manchester, which goes down 2,880 feet, but the dip of the seam carries the working to 3,360 feet deep. This is exceeded by the Pendleton colliery, which at its lowest part is 3,474 feet deep. Other countries having shafts over 2,000 feet deep are: Belgium, 3,937 feet; Austria-Hungary, 3,672 feet, Victoria 3,302 feet; Germany, 2,960 feet; and France, 2,300 feet.

Look at this! Three and one-half days to the coast! The Nickel Plate road makes the best connections with the fast trains for California. A through tourist sleeping car every Thursday. If low rates, fast time, and a comfortable trip are any object to you, drop a line to any agent of the Nickel Plate road, or to B. F. Horner, general passenger agent, Cleveland.

Chicago Programme of Big Improvements.

Several times of late the Review has directed attention to the fact that the people of Chicago who are interested in harbor improvements at that point are preparing to invoke government aid in lowering tunnels under the river. Their plan of action is plain now. Chicago has a Commercial Club, which is an old and substantial organization, limited to a membership of sixty and including among its members such men as P. D. Armour, Marshall Field, Francis B. Peabody and other millionaires. Tug men on the lakes are not millionaires as a rule, but Capt. J. S. Dunham happens to be numbered among this circle of Chicago's wealthiest men, and when he was invited to prepare a paper for a dinner which they held a few evenings ago, he outlined the programme of river improvements that are to follow the appropriation of \$700,000 recently obtained from the general government. This appropriation was secured largely as a result of the war department having some time ago undertaken supervision of navigation interests in Chicago river. It was supposed that the appropriation covered both dredging and straightening of the channel. The Washington authorities say, however, that the wording of the appropriation is such that the money can only be used for dredging purposes. Now the Chicago people are endeavoring to have an amendment adopted by congress which will make the balance, after dredging is paid for, available for straightening the channel. They will very probably succeed in their effort. But the plan of securing deeper draft over the tunnels is a feature of the scheme of improvements that is equally important. It is not expected that the government will do this work, but its influence will be used in the matter, as explained in the following extract from the programme outlined by Capt. Dunham:

"A great many people ask me," he said, "if I believe the tunnels can be lowered to give a draft of 20 feet over them. I say most positively yes, and instead of 20 feet there should be 26 feet. If the tunnels are to go down the draft of water over them ought to be sufficient not only for the present hour, but for many years to come. As you all know, the city tunnels at Washington, Van Buren and LaSalle streets have become the great arteries of street car traffic. The objection is at once raised against any proposition to lower them that it will result in a great inconvenience to the public, and that for months passengers must be landed far from their places of business. I am convinced that there is little in this objection. Three competent engineers have informed me that it would be feasible to lower the tunnels with the stoppage of street car traffic for only a few days. Their plan is to leave the roof as it is, but go down with the foundations and side walls some ten or twelve feet. The tracks would be left on trusses or supported in some way, while the space between the old bottom of the tunnel and the new bottom was being excavated and rebuilt. The new tracks could be laid and everything prepared for the cable while the cars were still running on the old tracks. All the time that would be lost would be taken up by the removal of the old tracks and supports. After the cars were running on the new tracks the crown of the tunnel could be removed, the river could be coffer-dammed in sections without stopping navigation, or a new roof could be built and the old one then dredged or blasted off. The procedure which the River Improvement Association will doubtless follow to secure the lowering of the tunnels will be by a petition to the secretary of war against them as obstructions to navigation. During the last season a number of boats have caught on both Washington and LaSalle street tunnels. A statement of every such stranding has been prepared for future action. When the association decides that it is time to go ahead, these statements will be sent to the war department at Washington with a formal complaint against the tunnels as 'unreasonable obstructions to navigation.' If the secretary of war follows the usual custom the complaint will be returned to the United States engineer stationed at Chicago and in charge of the government of the river. He will at once investigate the complaint, and if the River Improvement Association can convince him that the tunnels are 'unreasonable obstructions to navigation' he will so report to the war department. It is seldom that the report of the engineer in charge is overruled by the secretary of war, and if it is not in this case the war department will order the owners of the tunnels to lower them, or, in other words, to remove the obstructions. If the owners refuse to do so then it is the duty of the United States district-attorney to begin suit, but you well know that the beginning of a lawsuit is far from its end.

"But the public opinion will ward off any danger of law-

suit and the efforts of the River Improvement Association are now directed with a view to securing the support of the people."

One of the greatest arguments that will be held out in Chicago to secure public support of river improvements has reference to the equality of freight rates from Lake Superior and Lake Michigan that has been brought about by deeper channels in the Sault river. Referring to this feature of the subject, Capt. Dunham said: "Before the opening of the government work in St. Mary's river the usual ratio of freights between Chicago and Duluth in the grain trade was about 1 1-2 cents on wheat from Chicago and 3 cents from Duluth. There was then about 14 feet 6 inches of water in Lake Superior navigation as compared with 16 feet over the Chicago tunnels, but as soon as boats could load as deep from Lake Superior as from Chicago the ratio between the two points was changed, and there is now but little difference in the cost of transportation between them. The lines showing the rates of transportation on Duluth and Chicago wheat frequently overlap each other on the charts. It will take but little more work by the government before our great competitor in the grain trade on Lake Superior will have the advantage of between 18 inches and 2 feet more water than over the tunnels in the Chicago river. You all know the effects that such advantages will give our Lake Superior competitors. I will only add one technical point. Vessel owners as a rule prefer sending their boats to Lake Superior instead of Lake Michigan, owing to the improved appliances for handling cargoes at Duluth and West Superior. On even terms Lake Superior will get the boats and Chicago must pay a premium in higher freight rates to bring them here."

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Dec. 26, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago	13,349,000	5,568,000
Duluth	2,684,000	8,000
Milwaukee	350,000	3,000
Detroit	383,000	50,000
Toledo	1,134,000	153,000
Buffalo	2,545,000	350,000
	20,445,000	6,132,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 389,000 bushels of wheat and an increase of 306,000 bushels of corn.

Yacht builders who were interested in the discussion that attended the Enquirer-Say When race in these columns some time ago were greatly disappointed on account of the conflicting reports as to sizes of cylinders of the Say When's engines, which were given out by people who were supposed to know something about the engines. Hon. W. J. White, owner of the Say When, has been as much disturbed as anybody on account of these errors. Capt. Todd of the Say When admits that he was mistaken in the sizes of cylinders given out by him, but he seeks to amend matters now by announcing that in accordance with orders from Mr. White the cylinders have again been measured and the sizes are, positively, 11½ inches, 16½ inches and three of 22½ inches.

Where are the growing cities of the middle west located? Where lake transportation is available. Cleveland is outstripping Cincinnati. Buffalo is the most thriving city in the Empire State beside New York. Detroit, Milwaukee, Duluth and a score of smaller places have made wonderful strides and are outstripping their rivals which have not the advantage of cheap water transportation. Chicago escaped the threatened and anticipated collapse after the World's Columbian Exposition, and the recent election in that city showed that its population had made a remarkable gain. There can be but one cause for this great advance in all lake cities, and that cause is the advantage cheap water transportation gives them.

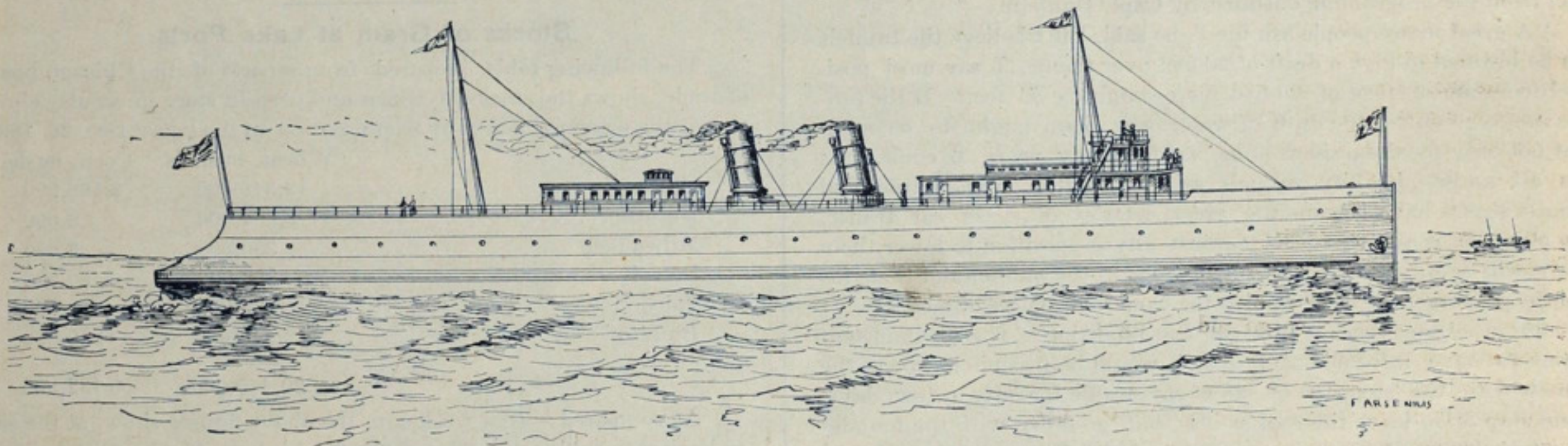
Holiday excursion tickets are on sale via the Nickel Plate road on Dec. 24, 25, 31, and Jan. 1, 1897. Return limit Jan. 4. 409 Dec. 31

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building.

A Staunch and Elegant Car Ferry.

In the F. & P. M. Ry. Co.'s car ferry *Pere Marquette*, which was launched at West Bay City Wednesday, the 30th, F. W. Wheeler & Co. have undoubtedly turned out the finest vessel of her kind ever built in this country. This has reference, particularly, of course, to the fact that she is entirely of steel and built very strong, but the *Pere Marquette* is also a good looking boat. She carries two pole spars, and, with smoke stacks placed fore and aft, presents an appearance that is far above anything that might be expected in a car ferry. F. W. Wheeler & Co. have guaranteed this steamer to make an average speed of $12\frac{1}{2}$ miles an hour. She goes at once to her route on Lake Michigan between Manitowoc and Ludington, and can move thirty loaded cars each trip, carrying also 200 tons of fuel, on a draft of 14 feet.

The length of this vessel between perpendiculars is 331 feet; length over all, 350 feet; beam, 56 feet; depth below main deck, $19\frac{1}{2}$ feet, and depth from upper deck to floor, 36 feet 13 inches. Side channels are 12 by 3 inches and calculated to withstand a pressure of twenty-five pounds to the square foot. The channels have 24 inches spacing amidship and 14 inches forward. Channel beams, which are thoroughly braced vertically and horizontally, span the hull at close intervals midway between the floor and main deck, to resist the crushing pressure of ice shoves during the severe winters. The hull has six water-tight bulkheads, dividing it into seven water-tight compartments for safety in case of collision. If any two of the compartments should fill with water the steamer would still be able to carry its load. The forward plating is $\frac{3}{4}$ -inch thick and double for a distance of 60 feet



CAR FERRY PERE MARQUETTE.

back of the stem. The plating is also doubled on the between-deck beam strake. The keelsons are close and extra heavy, and in the forward compartments they are almost solid. About 2,700 tons of plates and angles were used in the construction of the hull, and only steel rivets were used for fastenings. Insurance agents and representatives of other ship building concerns who have seen the *Pere Marquette* under construction unite in saying that the workmanship has been of a very excellent and thorough kind all through.

She has twin screws operated by two compound engines having cylinders of 27 and 56 inches diameter with 36 inches stroke. The screws are 11 feet in diameter. Shafting tubes similar to those first fitted in the American line steamers *Paris* and *New York* are carried out from the hull and contain cast steel tubes in which the shafts are operated. Steam will be furnished by four boilers, each 13 feet 3 inches in diameter and 12 feet long, and allowed a working pressure of 130 pounds to the square inch. There is, of course, the usual modern outfit of steam windlass, steam capstans, steam steering gear, etc., and an electric light plant with a 16-inch lens search light. Deck houses are of wood. In addition to pilot houses and texas forward there are ten staterooms and a smoking room. Aft there is another house containing the kitchen and dining room, as well as quarters for a part of the crew.

During the year 1896, fifty-seven firms in Great Britain built vessels aggregating in each case more than 5,000 tons, and the output of some of them was as high as 60,000 to 80,000 tons. The output of fifteen firms was above 30,000 tons, with ten above 20,000 tons, and seventeen above 10,000 tons.

The new 33-knot British torpedo boats building at Birkenhead are to have five smoke stacks.

Insurance Matters.

Although there is considerable speculation as to what the insurance companies will do next season, all the talk indicating a lower range of premiums on account of the large earnings of underwriters during the past years, it is not probable that there will be any business undertaken or any rates made for some time to come. The resident agents undoubtedly realize that unless they can manage in some way to have their companies meet the so-called foreigners on an equal basis in all respects, they must certainly lose, again next season, more of the best class of business, which they lost almost entirely in 1896, and in this they are at a further disadvantage, in view of the fact that the foreigners made money out of the big business which they took last season and may be prompted to still further reduce rates. As yet no arrangements have been made for a meeting of the Inland Lloyds and nothing has been said about a new register. It is probable, however, that the general agents may hold a meeting in Detroit at the time of the Lake Carriers' meeting, according to the custom of past years.

Capt. J. V. Tuttle of Milwaukee has given up his residence in that city, and it is said that he is at present engaged in inspecting vessels at Buffalo and will visit all of the lake ports where large carriers are laid up for the purpose of ascertaining their condition. This work is being done in the interest of the British & Foreign and North American Syndicate, with a view to getting up a vessel register exclusively for private use, the important features of which will be covered by cipher and therefore accessible only to those possessed of an accompanying code. This has led to surmise as to the object the syndicate has in view. Heretofore the syndicate has paid atten-

tion almost exclusively to the cargo business, although in few instances hull risks have also been carried. The preparation of a vessel register, therefore, may forecast an intention hereafter to take risks on both hulls and cargoes, or it may be nothing more than a conservative move to confine the acceptance of cargo risks to vessels of the highest grade. However, to most vessel men it will appear as if the syndicate intends to enter the field for risks upon vessels of the better class at rates below those which may be adopted by the agencies comprising the Inland Lloyds.

Congressman Burton of Ohio, Congressman Smith of Michigan and other representatives from lake districts, who have interested themselves in trying to overcome the disadvantage of lake ship builders not being permitted to build vessels of war, are said to be working in harmony and will endeavor, immediately after the holidays, to have the house committee on foreign affairs take up the subject. It would seem that in this congress it would at least be possible to obtain information sufficient to permit of intelligent action when the new administration takes hold in Washington.

In one of the early fall gales on the lakes the Lehigh Valley steamer, *E. P. Wilbur* shipped considerable water on Lake Michigan. Several Chicago merchants sustained losses on imported goods that were injured by the water. They submitted the matter to the treasury department and all duty on the goods has since been abated. Knowledge of this fact may prove advantageous to other merchants in lake cities who meet with losses in this way.

Why not avail yourself of the opportunity of visiting friends while holiday rates are in effect via the Nickel Plate road. Tickets on sale Dec. 24, 25, 31, and Jan. 1, 1897. Return limit Jan. 4. 408 Dec. 31

Delays in the Coal Trade—Grain Shortages.

Editor Marine Review:—Your editorial, issue of Dec. 24, strikes me as being worthy of the consideration of every vessel owner who is desirous of benefiting himself or the vessel interests of the lakes. Of late years, Lake Carriers' meetings have been conventions of turmoil and agitation regarding navigation laws, load lines, rules of the road, Detroit bridge and "Soo" river rules, and the effect in all cases has been of a telling kind. Systematic methods of remedying these evils have in every case proven successful, and the gentlemen chosen by the association to fight its battles have earned the appreciation that has been accorded them. But you say no big improvements in lake waterways or questions of special importance are to be taken up at the coming annual meeting. If this be the case, what better subjects could be acted upon than those to which you refer?

The subject of delays in the coal trade is one worthy of most careful and painstaking consideration. The mere fact that this subject is one appealing directly and immediately to the interests of vessels should be enough to inspire every owner attending the coming annual meeting to prepare for a discussion of it, with a view to adjourning the meeting on a full understanding that henceforth his boats can carry coal with a prospect definitely before him; with a certainty as to how long he must wait after arrival at port of discharge. A successful conclusion of this effort to have a time-limit clause in coal bills of lading would be a benefit inestimable to the lake carrying trade. The results would be attained at once and directly by every owner, and I trust that your editorial on the subject will meet with hearty approbation from innumerable readers of your paper who are interested in the carrying trade. I, for one, want a time-limit coal bill of lading. With such a bill of lading, I can, in case I choose to take a 20-cent load of coal, estimate the time it will take me to discharge the same, and at the same time I can calculate, myself, how I am to come out on other business, in view of which I took the 20-cent coal. But I can not do this if I am to depend upon the ever-ready promise of quick dispatch, which is always at hand when I am talking charter.

As to grain shortages, it certainly seems strange that owners have for so many years remained partners to abuses that have prevailed in the custom. I believe there should be some co-operation in the distribution of losses attending grain shortages, but instead of at once weighing out a vessel's cargo and taxing her for shortage, or paying her for over-run, there should be a comparison of weights from elevators and railroads. It would be far better if elevators would find some means by which the vessel would be compelled to carry an amount of cargo somewhat in excess of bill of lading weight, as is the case in the ore trade. Then we would at least feel satisfied that we were being paid for about what we were carrying, and would not fear the expense of finding, upon a return of bills, that one lot of 20,000 bushels had an over-run of ten bushels, while another lot of the same amount fell short 500 bushels. I am glad that you have given out, in this editorial, your views on these subjects, and I trust that the Lake Carriers' Association will deem them of great importance to their interests, and will endeavor, with the same vim and earnestness that has characterized their past proceedings, to rectify them as far as it is possible to do so.

Vessel Owner.

Cleveland, Dec. 30, 1896.

At Gladstone, Not Escanaba.

Editor Marine Review:—I notice in your issue of Dec. 17, under the head of "Facts About the Season of 1896," you state that the steamer Zenith City arrived at Escanaba—the first arrival for the season—on April 18. That you may be set right in the matter, I wish to say that the Zenith City arrived at Gladstone—the first arrival for the season—on April 18, and not at Escanaba. She took a full cargo of ore from here to Chicago on the 19th.

W. M. Kellie, Superintendent.

Minneapolis, St. Paul & Sault Ste. Marie Ry. Co.,

Gladstone, Mich., Dec. 24, 1896.

John Johnson, who established the first regular line of excursion steamers on the St. Lawrence between Cape Vincent and Clayton, died at his home in the latter place a few days ago, aged eighty years.

Solid through trains between Chicago, Buffalo and New York city, and through sleeping cars to Boston, constitute the through service of the Nickel Plate road. Rates always the lowest. 412Dec.31

A Hudson River Boat.

In view of the progress that has attended the use of quadruple expansion engines and high steam pressures in marine service, it may appear surprising at first thought to find a new steamer, even in river service, fitted with a beam engine of the simple surface condensing type. Not long ago the Review printed an illustration of the big Hudson river side-wheel steamer Adirondack of the People's Line, which was in service during a part of the past season, and which, with a length of 412 feet over all and five decks, is the finest steamer on the Hudson. The Adirondack has 350 staterooms and 286 berths in cabins, together with a freight capacity of 1,000 tons, and all of this on a draft of 8 feet of water. It will thus be seen that she is built for special conditions of service on the river, and these conditions also explain the use of a simple engine. She is in service during only a part of the year, and makes but one trip a day, of about ten hour's duration. It was estimated that the total value of the fuel saved during the comparatively brief hours of service would not equal the interest on the extra cost of building and running a compound or triple expansion engine.

The engines extend up through four decks, and the foundation consists of deep steel keelsons, which are securely bolted to very heavy wooden keelsons in the hull. In this connection it may be noted that the hull is almost entirely of wood, this material being used in preference to steel on account of the heavy strains to which the river boats are subjected in pushing their way over sand bars in time of low water. A-shaped gallow frames for the engine are built up of steel plates, the legs, which are of box section, being strongly braced together with struts, which are also of plate steel and open box section. The walking beam consists of a strongly ribbed cast iron web, belted with a heavy wrought iron strap, the whole being firmly strapped and keyed together. The cylinder is 81 inches in diameter by 12 feet stroke. Two large vertical pipes in front of the cylinder are known as the side pipes, one on the starboard side being the steam pipe and the other the exhaust. Each of these pipes carries a separate rocking shaft which is operated by its own eccentric. The motion of each rocking shaft is communicated to two vertical lifting rods which operate the valves by means of two cams called "wipers." The eccentric rods are formed with hooks at their outer ends, which engage a pin in the arms of the rocking shaft. They are thrown out of gear by means of slotted vertical rods, through which the eccentric rods work. These vertical rods are known as strippers, and they are operated by levers attached to the rocking shaft on the steam pipe. When it is desired to start or reverse the engine, the eccentrics are thrown out of gear, and the valves are worked by a steam starting and reversing engine. A hand wheel on a small vertical standard in front of the exhaust pipe opens the steam valve for the starting engine, and wheels on two other standards operate the injection valve and turn the surface condenser into a jet condenser, if at any time it should be desired to do so. The surface condenser is located in front of the steam cylinder and below the main deck. Behind the steam cylinder and also below the main deck is the air pump, which is operated by connecting rods from the walking beam. The paddle wheels are of the feathering type. They are 30 feet in diameter and carry twelve curved steel buckets, each 45 inches wide by 12 feet 8 inches long. The dip is about 5½ feet. The average speed of revolution is about twenty-six per minute.

Auxiliaries include a donkey boiler, and two Worthington duplex fire and wrecking pumps, and a large Worthington admiralty bilge pump between decks, their combined capacity being 1,000 gallons per minute. The electric light plant, consisting of three direct connected sets, has a capacity of 2,400 lights. Steam is supplied by four steel boilers of the lobster return-flue type, each 11 feet wide, 9 feet 3 inches diameter of shell and 33 feet long, with steam chimneys 87 inches in diameter and 10 feet 6 inches high. Forced draught is supplied by two large blowers, driven by independent engines. The steam pressure is 55 pounds to the square inch, and the total horse power 4,000. Both engines and boilers were constructed by the W. & A. Fletcher Co. of Hoboken, N. J. On the run of 144 miles between New York and Albany the Adirondack has averaged 18 miles an hour, and in the deep water between New York and Hudson she has attained a speed of 20½ miles an hour.

A photograph of the largest boat on the lakes, the Sir Henry Bessemer, will cost you only \$1.50. Write the Marine Review.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/4 per cent. of the whole, but largely in American vessels.

Numerous efforts were made by the newspapers to obtain from the Canadian and United States deep-waterways commissioners, who met in Detroit recently, a statement of what their reports would contain. The results were in all cases unsatisfactory, as the commissioners would not, of course, give out, in advance of reporting to the government authorities, anything but a sort of a general statement to the effect that they were collecting a vast amount of data pertaining to the lakes. A brief statement made by one of the United States commissioners since the adjournment would indicate, however, that the report will admit the inability of the commissioners to present much of value from the \$10,000 that was allowed for the service and will ask for a continuance of the work with additional funds. The brief statement referred to is as follows: "Our meeting at Detroit was entirely harmonious, no differences developing among ourselves or with the Canadian commission. We have agreed upon and signed a report setting forth the general aspect of the whole question, to which will be appended the topical matter which has been under investigation, such as profiles and maps of all available routes, complete water record from the earliest times, wind phenomena, etc. The American report will be sent in during the last week of December or first week of January, and congress will be asked to continue the work with sufficient funds to make final surveys on the most available lines, to measure the lake outflow, etc. The Canadian report will be a separate document, which they will prepare later and submit to their parliament. I can hardly forecast the conclusions of the commission."

Executive officers of the Lake Carriers' Association have found Congressman T. E. Burton of Cleveland willing to take upon himself the great labor of looking after all details of legislation pertaining to lake interests as a whole, especially the matter of aids to navigation, which involves a great deal of committee work and dealings with the light-house board. It is not the intention of the association or Mr. Burton to slight other members from lake districts in these matters, or to take from them any of the credit due to their efforts in behalf of the lakes, but it is necessary, of course, to act largely through one source in consultations, communications, telegrams, etc. Mr. Burton is now serving his third term in congress. He is fully acquainted with department officials and with committee work, and it is not at all probable that members from lake states will hesitate about acting with him on the several measures which he will have in hand.

One special effort in the present congress will be to secure a liberal appropriation for gas buoys to be distributed in various parts of the lakes. Members of the Ship Master's Association, who have been delighted with the few buoys of this kind which they have had during the past season, are requested to send Mr. Burton an endorsement of them, either through their organizations or as individuals. Officers of the Lake Carriers' Association have a large number of these endorsements in hand, but the more the better.

Few people connected with lake shipping have any idea of the enormous competition that the lake route has been meeting with of late years in the export flour and grain trade from such southern ports as New Orleans, Galveston and Newport News. Buffalo's elevator monopoly, with its high transfer charges, is one of the prime causes of this trade being diverted from the lakes. It would not take much to stir up quite a disturbance on this score at the coming meeting of the Lake Carriers' Association. The plan of having New York state take over and operate the grain elevators is undoubtedly objectionable in principle, but lake vessel men have been giving considerable attention to the subject since a bill with that end in view was introduced in the New York state legislature, some time ago, and they may be heard from later on.

Elaborate Christmas and New Year's greetings are not expected from a plain, business-like publication, such as the Review aims to be, but it would hardly be fitting to allow this issue to go to press on the last day of the year without saying that it is our sincere wish that the joys of this blessed season have extended to all our readers and that peace, happiness and prosperity may come to them in the new year. A thought also of grateful remembrance for those who have passed from the cares and trials of this world during the past year brings to mind a list of honored names that is much larger than usual. Among them may be mentioned E. M. Peck, W. S. Mack, H. J. Webb, John Rice, W. B. Guyles, John Fitzgerald, Col. James W. Pickands, Fred C. Smith, Conrad Starke and John Tod.

A full statement of the volume of iron and steel exports from this country during 1896 will, when it is prepared, shortly, prove surprising, even among people who are well posted in matters pertaining to the iron industry. This export trade has been hampered during the past few months by very high ocean freights, which have prompted the building of an immense amount of new tonnage throughout Great Britain. The freight situation is easing up, however, and it is certainly only a matter of a little time until a great deal will be heard of the foreign movement of iron and steel that has been laughed at in some quarters. It is stated positively that early in the past summer, when ocean freights were low, steel was shipped from Pittsburg to Liverpool for \$3 a ton.

Although it has been announced that the ways and means committee of the house of representatives will take up on Jan. 9 the question of a tariff on iron ore, and will give a hearing on that day to ore producers, there is not very much interest in the matter. The Western Iron Ore Association is preparing for a meeting in Cleveland this week to discuss the question, but it is not probable that they will try to have any change made in the present tariff of 40 cents a ton. It may be said, in fact, that the general expectation that there will be no change in the present tariff is the cause of a lack of interest in the subject.

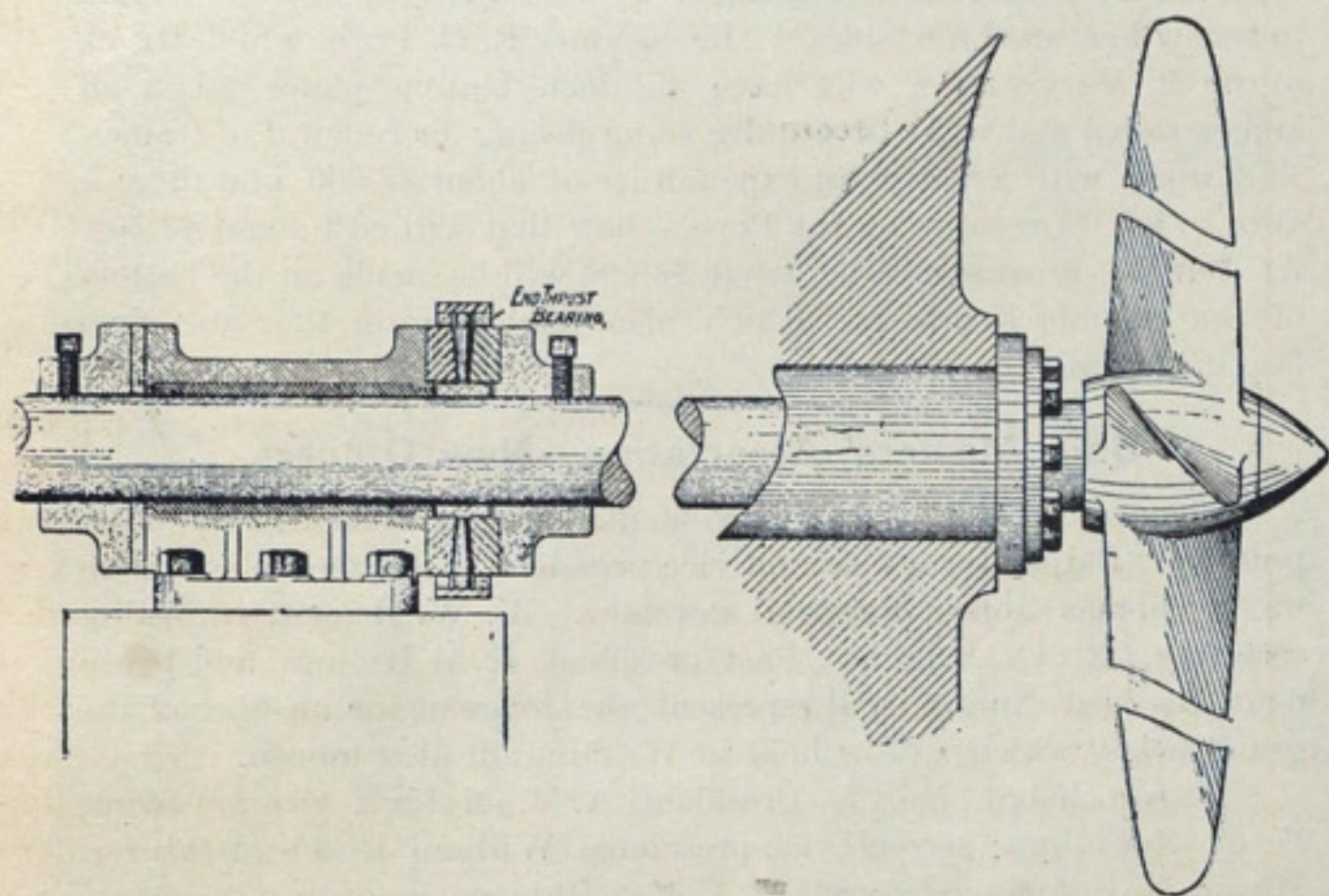
At the coming meeting of the National Association of Manufacturers in Philadelphia—Jan. 26-28—the chief subject of discussion will be the tariff, an immediate revision of which will be urged by the convention. But another important subject, the consular service, which concerns the shipping interests, will also be discussed. The manufacturers propose, if possible, to improve this branch of the government service, and it is hoped that they will be successful, as there is room for improvement if men of sound business judgment are put into the places that have been held by worn out politicians.

It is expected that the Nicaragua canal bill will come up again in the present congress, but it is not at all probable that it can be passed in this short session, in view of the opposition from the United States commission that reported during the last session.

The Review has excellent photographs of lake ships.

Thrust Bearings for Propeller Shafts.

Although rapid strides have been made in marine engineering during the last ten years, and the present use of pipe boilers, together with engines which utilize steam expansion to a wonderful degree, seems well nigh perfection, yet very little improvement seems to have been made in the thrust bearing on the main shaft. As this bearing must resist all the thrust required to drive the vessel through the water its durability and economical operation, as regards both coal consumption and lubrication, become a matter for the most serious consideration. Numerous devices are in use today, ranging from the simple adjustable collar and pillow block on small launches to the large bearings on ocean greyhounds with their accompanying horseshoe rings, designed for easy removal and inspection. Latterly some of the smaller high-



speed craft have been furnished with a ball bearing thrust, a simple grooved collar and block carrying a ring of balls. This, as is well known, although most practical on small launches of not more than 10 horse power, is useless on larger powers where the balls are quickly crushed and their grooves worn out of line.

The Mossberg & Granville Mfg. Co., Providence, R. I., has devised a plan which aims to overcome these defects. Their bearing was originally designed to take up the end thrust on the draw beds and broaching presses made by them, they having previously tried all known forms of ball bearings with no success. In this form of bearing the strain is taken by conical rollers placed radially in a bronze cage, while the thrust block and shaft have conical steel disks, hardened and grooved to the same angle as the cones. The cage and disk may be halved when necessary. In the illustration the application of this bearing to a propeller shaft is clearly shown. This bearing has been in constant use for two seasons, with no perceptible wear, although receiving a strain of more than 80 horse power. The owner of the vessel to which this bearing has been applied states that its use results in raising the rotative speed from 250 to 280 revolutions per minute, with less strain on the engine and less coal consumption. On a test recently made at the factory the friction co-efficient of this bearing was found to be about 0.005, against the accepted 0.049 for plain bearings under similar conditions.—Iron Age, New York.

At the beginning of 1896 the length of navigable rivers and canals of France was 8,594 miles, of which 5,211 miles were rivers and 3,383 miles canals, and of these, 2,627 miles only are classed as principal lines of navigation, that is, having a draught of 6½ feet. These rivers and canals are now all in the hands of the state. The traffic on them during the year 1895 amounted to 27,173,904 tons, showing a decrease of 699,571 tons by comparison with 1894. The number of boats in the service on rivers and canals was, for the last year for which statistics are available, 15,925, giving employment to 19,579 men, 7,917 women, and 12,972 children. The principal elements of traffic were building materials, coal and coke, agricultural products, fire wood, iron and steel, etc.

Low holiday rates will be in effect via the Nickel Plate road on Dec. 24, 25, 31, and Jan. 1, 1897. Tickets will be good returning until Jan. 4. A splendid opportunity of spending Christmas or New Year's day with the home folks and friends.

407 Dec. 31

Trade Notes

A calendar issued by the Ashton Valve Co., 271 Franklin street, Boston, portrays one of those old homestead views that are pleasing to every one. Engineers and purchasing agents not already supplied should apply for one.

A contract for one of the longest highway bridges in the United States has just been awarded by the counties of Ocean and Monmouth, N. J., to the Berlin Iron Bridge Co. of East Berlin, Conn. The bridge will be 1,910 feet in length. The secretary of war has ordered a draw span constructed in this bridge, which will give two clear openings, one of 45 feet and the other of 50 feet.

The Buffalo Forge Company, Buffalo, N. Y., has issued a 400-page, library bound catalogue, and parties who use fans, blowers etc., not having received a copy, will do well to write the company. Illustrations and descriptions of Buffalo fans in every conceivable shape, and for every imaginable purpose, make up the book. Several pages are devoted to marine mechanical draft. Blacksmith shop outfits are illustrated and described. It is a well-printed and valuable book.

Marine engineers can obtain one of the handsomest calendars of the new year, free of charge, by addressing the Roberts Safety Water Tube Boiler Co., 41 Cortlandt street, New York, and giving full names and addresses with name of last vessel on which they were employed. These calendars are a perfect picture and even superior to those issued by the Roberts company last year. They are sent in a mailing tube. Six cents in postage can be remitted if desired but it is not insisted upon.

The use of Jeffery's patent marine glue has become so general that recommendations of it are hardly necessary. On the coast it is used for caulking deck seams of the smallest yachts and the largest passenger steamers. It has several advantages over the material ordinarily used. One is that it does not spill out of the seams in hot weather but sinks. In cold or wet weather a slight corrugation appears above the planks, but it does not crack even then, and does not stick to the feet in warm weather. It is in use in the United States and British navies and is sold by L. W. Ferdinand & Co., who have removed to 176-180 Federal street, Boston, and is kept on hand by lake ship chandlers.

Cargo and Speed Records—Lake Freight Steamers.

Iron ore—Coralia, Mutual Transportation Co. of Cleveland, 5,088 gross or 5,699 net tons, Gladstone to Ashtabula, draft of 16 feet 10 inches. From Lake Superior—Steamer Sir Henry Bessemer, Bessemer Steamship Co. of Cleveland, 4,637 gross or 5,194 net tons, Ashland to Conneaut, draft of 15 feet 9 inches.

Grain—Steamer Queen City, A. B. Wolvin of Duluth, 207,000, bushels of corn, equal to 6,210 net tons, Chicago to Buffalo, 16 feet 8 inches draft; steamer Maricopa, Minnesota Steamship Co., Cleveland, 191,700 bushels of corn, Chicago to Buffalo; steamer Zenith City, A. B. Wolvin of Duluth, 289,000 bushels of oats, Chicago to Buffalo. From Lake Superior—Steamer Queen City, A. B. Wolvin of Duluth, 156,256 bushels of barley and 58,000 bushels of wheat, equal to 5,490 net tons, Duluth to Buffalo.

Coal—Schooner Geo. N. Hartnell, 4,777 net tons of anthracite, Buffalo to Milwaukee, draft 15 feet 5 inches; S. S. Curry, Hawgood & Avery Transit Co. of Cleveland, 4,535 net tons bituminous, Conneaut to Gladstone.

Speed—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Co. of St. Clair, Mich., Buffalo to Duluth, 997 miles, 65 hours and 10 minutes, 15.3 miles an hour.

During 1896 British ship builders launched new ships aggregating 1,326,822 tons, against 1,156,571 tons in 1895. Of this total the national dock yards, five in number, turned out 71,970 tons, which compares with 70,350 tons in 1895, but even this total is eclipsed by that of one firm—Harland & Wolff of Belfast—who, as stated in the Review a week ago, added 81,316 tons to the mercantile marine during the year. The next largest output is at Newcastle, where Sir W. G. Armstrong & Co. turned out 54,147 tons with 67,770 horse power; Hartlepool comes next, where Sir William Gray & Co. turned out 43,545 tons, and the fourth position on the list is occupied by Messrs. Connell & Co. of Scotstoun, who are represented by 40,864 tons.

Around the Lakes.

An annex with a capacity of 300,000 bushels of grain is to be added to the large elevator of the W. W. Cargill Co. at Green Bay.

Commodore Miles Barry of the Independent Tug Line and Capt. James A. Calbick, both of Chicago, have been in Cleveland on business during the week.

Gen. Supt. Potter of the Flint & Pere Marquette Railway Co. has resigned to accept a position with an eastern company. He will be succeeded by W. D. Trump who was assistant general superintendent.

Postmaster Enright of Detroit is engaged in an effort to have the postoffice department secure an appropriation sufficient to build a steam vessel that will be especially suited to the marine delivery service on the Detroit river.

Milwaukee has in winter quarters ninety-two vessels, of which thirty-nine are steamers, forty schooners and thirteen barges. Manitowoc has in all thirty-two vessels and Tonawanda has forty-one, of which fifteen are steamers and twenty-six barges.

Mr. E. A. Meeker of Huron, engineer of the steamer Onoko, and Miss Edith Mae Davenport of Sandusky, were married at the home of the bride's parents in Sandusky a few days ago. The wedding ceremony was elaborate and was attended by a large number of friends.

Employees of the Canadian canal at Sault Ste. Marie were told, when the canal was closed recently, that if their services were required for another year they would be notified when they were needed. This is taken as a dismissal, on account of numerous changes that are being made in all departments of the government by the new administration at Ottawa.

There is probably little truth in the report that a Detroit vessel owner, having two steamers on which insurance amounted to \$10,000, allowed them to run through the past season without being covered by insurance of any kind. Two steamers requiring an amount of insurance equal to that indicated by a premium of \$10,000 would be of the best class, and owners are not in these days taking risks of a total loss of \$250,000 or more on two vessels.

At the annual meeting of the Marine Engineers Beneficial Association No. 1 of Buffalo, held a few days ago, the following officers were elected: Frank Miller, president and representative to national convention; James L. Walker, vice-president; Alfred E. Welch, recording secretary; Theodore A. Meyers, corresponding secretary; Peter Burns, financial secretary and treasurer; James Wixted, conductor; M. F. Hanna, doorkeeper; Frederick Hale, chaplain.

As had been expected all along, the Graham & Morton Transportation Co. of Chicago has purchased the side-wheel passenger and freight steamer City of Milwaukee from the Grand Trunk Railway Co. The price is not given out but it is thought to be \$105,000 to \$110,000. The purchasers will spend a large sum of money, probably \$15,000 or \$20,000, in remodeling the vessel for excursion business on Lake Michigan. The original cost of the City of Milwaukee when she was built in 1881 was above \$200,000.

There is nothing official about the announcement that H. A. Tomlinson and A. B. Wolvin will be interested next season in a new tug line at Duluth, that is to include the two big harbor tugs just completed by Capt. James Davidson, but the fact that Mr. Tomlinson is a son-in-law of Capt. Davidson gives color to the story. Duluth has been in need of good harbor tugs, and it is a fact also that Capt. Davidson has held his two new tugs at a high price, without much care as to whether they were sold or not.

Capt. Henry Stone, who was in the Northern line passenger steamer North Land last season, has severed his connection with the Northern Steamship Co. It is probable, therefore, that the North Land will be the boat to be taken by Capt. W. C. Brown. Mr. J. M. Davis, who is acting as marine superintendent at Buffalo, is looked upon as a very bright young man, and it is quite probable that he will be left in charge of the duties of that office. Capt. Stone is not as yet decided as to what he will do next season, but it is not at all probable that he will find difficulty in securing command of one of the best of the big lake freighters.

Joseph P. Weeks of Pittsburg, editor of the American Manufacturer, and well known in iron and steel circles as a statistician, died Saturday at his home in Pittsburg.

Ship Yard Matters.

A request from the Northern Steamship Co. for prices on two steel freight steamers is about the only announcement from the ship yards during the past week that has had any reference to new contracts. The Northern company has been forced to charter vessels for its package freight business during the past two or three seasons, especially in the fall, and it would not be surprising if a contract with one of the ship yards would develop from this inquiry. The vessels could not, of course, be gotten out for the opening of navigation, but the steamship company would be in greater need of them in the fall than during the early part of the season.

Several important repair jobs will be carried on at South Chicago during the winter. Capt. John Green of Buffalo is making arrangements to have his composite steamer Lewiston lengthened 60 feet and to renew her steel top sides. The steamer E. C. Pope, which struck in the St. Mary's river, will have eighteen bottom plates taken off and re-rolled and will also require some piecing or renewal of frames. This work will involve an expenditure of about \$7,000, and there is also a job of repairs on the Pope's bow that will cost about \$2,500. At Buffalo, repairs costing about \$6,000 will be made on the bottom of the steamer Kearsarge, which also fetched up in the Sault river late in the fall.

Ship Masters' Association—New Officers.

Cleveland lodge, No. 2—President, Bernard Nelson; first vice-president, Ralph Byrnes; second vice-president, A. J. Greenley; treasurer, Thomas Jones; financial secretary, W. W. Brown; recording secretary, R. C. Pringle. Past president J. A. Holmes and President Bernard Nelson will represent the lodge at the meeting of the grand lodge, which will be held in Washington next month.

Detroit lodge, No. 7—President, A. J. McKay; vice-president, H. C. McCollum; second vice-president, William Roach; treasurer, Hiram Still; financial secretary, Robert Rhynas; recording secretary, J. W. Westcott.

The Almy Water Tube Boiler Co., Providence, R. I., has just issued in pamphlet form a report on a series of evaporative trials, made with one of their boilers recently by Geo. H. Barrus, expert, of 95 Milk street, Boston. This report will certainly interest engineers and vessel owners who are desirous of keeping posted on the progress that is being made with the best types of water tube boilers. It is exhaustive and reliable, going into every detail necessary to form an intelligent opinion of the boiler. It appears from the results that, in point of economy, the boiler compares favorably with the best types. An evaporation of 11,922 pounds of water per pound of combustible, which was obtained on one of the tests, is rarely exceeded by any form of hand-fired water tube boiler, whatever its size. One of the noticeable features in the operation of the boiler was the dryness of the steam exhibited on all the tests. Even with conditions of forced blast, when over seven pounds of water was evaporated per square foot of surface per hour, the moisture was less than one per cent. The trials show that practically all of the heat units available in the coal were accounted for, either in useful evaporation or in chimney and other wastes.

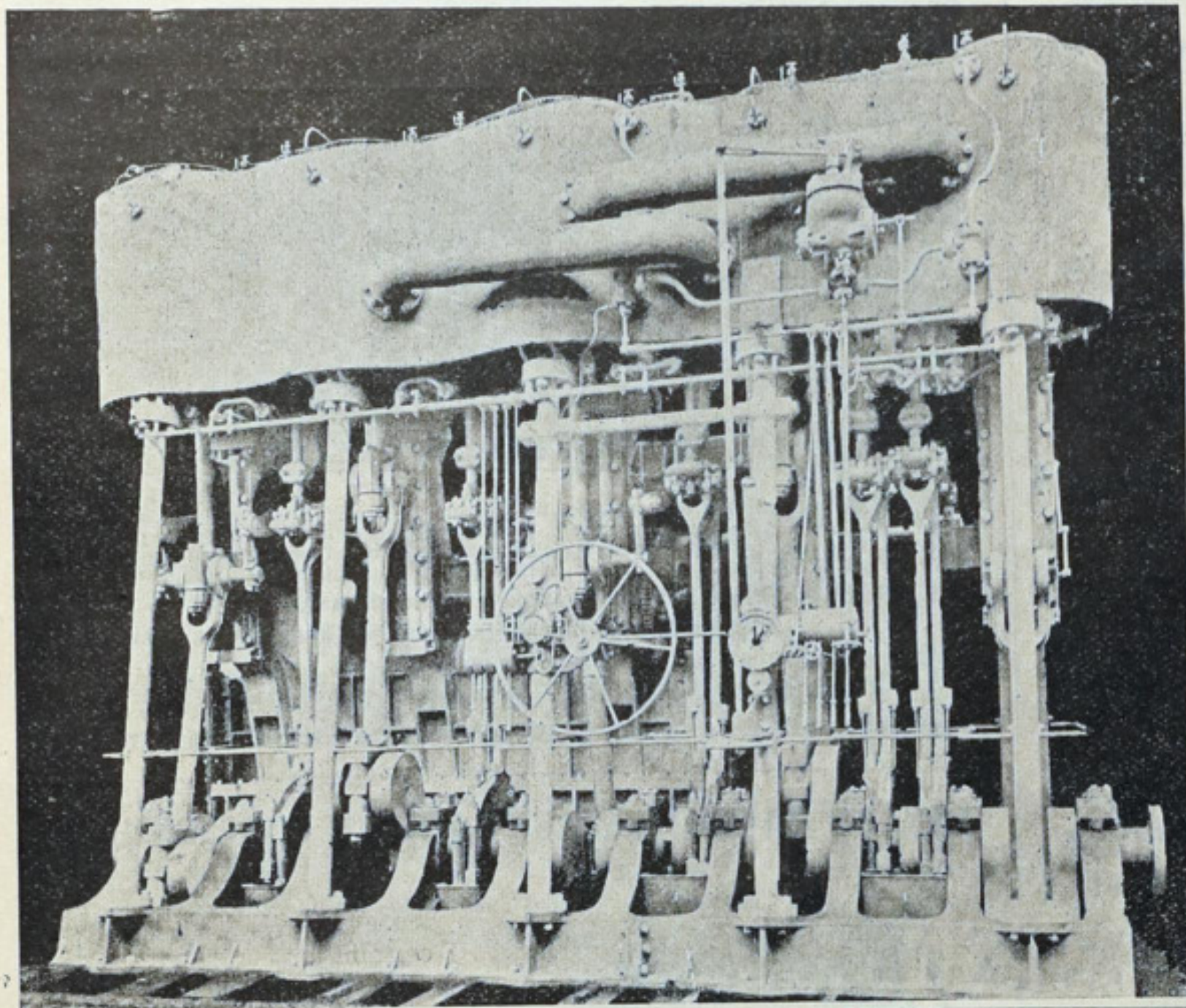
In connection with the purchase of the Mountain Iron mine from Mr. Rockefeller it would seem entirely in bounds to say that \$13 steel is a possibility under such a combination of economies as the Carnegie Steel Co. has secured for itself in the past year, taken in connection with its cheap fuel, through the identified interest which controls so large a proportion of the Connellsville coke output. The expenditure required to command these advantages has been enormous and this must not be overlooked in computations of cost, but the interest on investment is fractional in comparison with the resultant saving. It is understood that the Carnegie Steel Co. is to pay royalty on a minimum output of 600,000 tons a year from the Mountain Iron and that it is to mine ore only for its own use.—Iron Trade Review.

A chart of the whole of Georgian bay, the best thing of its kind as yet published, has recently been issued by the British admiralty, and may be had from the Marine Review, No. 409 Perry-Payne building. Another chart, of a very clear and interesting kind, taking in Lake Huron, Georgian bay, Lake Erie and connecting channels, has also been issued recently by the same authority.

A QUEER COINCIDENCE! THAT SERVE RIBBED TUBES AND ELLIS AND EAVES DRAFT

SHOULD BE IN THE BOILERS OF THE

Two Most Economical Cargo Steamers in the World!



ENGINES OF THE INCHMONA—

Hull, 325 feet long,
46½ " beam,
20½ " draft,

Engines, 17, 24, 34, 42 and 42 x 42 in. stroke.

THE BOILERS ARE FITTED WITH SERVE RIBBED TUBES AND THE ELLIS AND EAVES DRAFT.

This steamer carries 5,000 tons cargo, 9 knots an hour on a daily fuel consumption of 11½ tons coal. This amounts to 1.07 lbs. of coal per horse power per hour, over ½ pound less than the best showing made by any lake steamer with any kind of draft, and the lowest ever obtained in marine practice.

ENGINES OF THE KENSINGTON—
(AMERICAN LINE.)

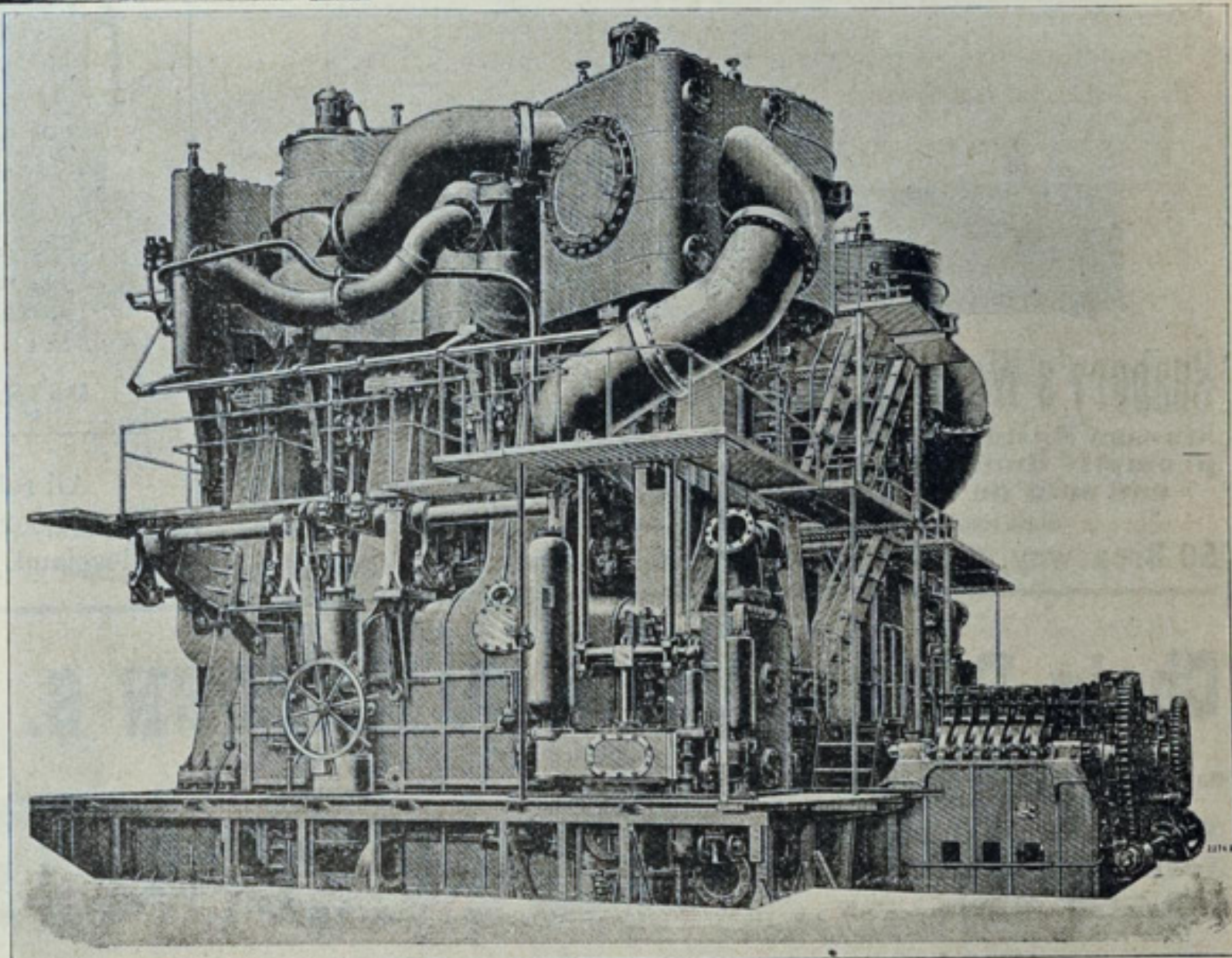
Hull, 480 feet long,
57 " beam,
40 " deep.

Twin Engines, 25½, 37½, 52½ and 74 x 54 in. stroke.

Boilers, Two Double-ended,
15 ft. 9 in. by 21 ft 5 in.
One Single-ended,
15 ft. 9 in. by 11 ft. 3 in.

FITTED WITH SERVE RIBBED TUBES AND THE ELLIS AND EAVES DRAFT.

Coal consumption per I. H. P. per hour on this steamer is 1.4 lbs. This is ¾ lb. less than the average lake steamer. Her cargo capacity is 10,600 tons.



Serve Ribbed Tubes and the Ellis and Eaves Induced Draft are to be installed in at least two lake steamers during the coming winter,—and it can be guaranteed that these steamers will have a fuel consumption as low as 1½ lbs. per I. H. P. per hour. A result of 1¾ lbs. has been obtained with the Ellis and Eaves Draft and Plain Tubes in the L. C. Waldo.

Owners of steamers contemplating repairs to boilers during the coming winter can learn how they can save the cost of the repairs in one season, by writing to

THE GLOBE IRON WORKS COMPANY, CLEVELAND, OHIO.

J. S. DUNHAM,
President.CAPT. THOS. JOHNSON,
Chief Engineer & Wrecking Master.CAPT. J. R. SINCLAIR,
Superintendent.**DUNHAM TOWING & WRECKING CO.****15 TUGS AT CHICAGO,**
Chicago Telephone, No. 852 Main.**4 TUGS AT SO. CHICAGO,**
So. Chicago Telephone, No. 63.

Steamers when outside wanting our tugs, blow one long and one short blast of the whistle.

**TUGS, STEAM PUMPS, DIVERS, HAWSERS, LIFT-
ING SCREWS, LIGHTERS, Etc., for Releasing
Stranded or Raising Sunken Vessels,**

Furnished promptly on orders by telegraph or otherwise.

Office open Day and Night.

210 South Water Street,

Private Telephone on 16th St. Ry. bridge,
and at Life Saving Station, South Pier.**CHICAGO, ILL.**

INCORPORATED 1794.

Insurance Company of North America.**CAPITAL, Paid up in Cash, - - \$3,000,000.00**
ASSETS, 9,487,673.53

CHARLES PLATT, President.

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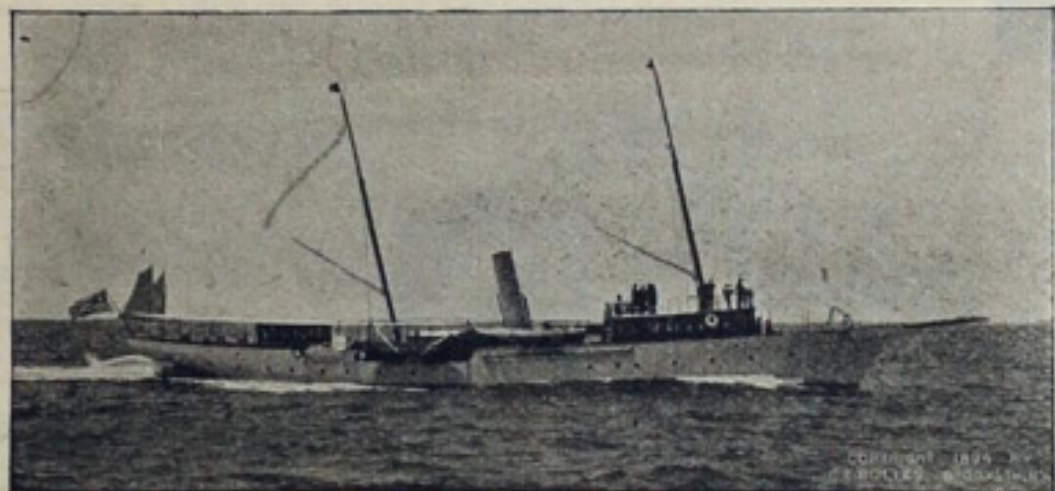
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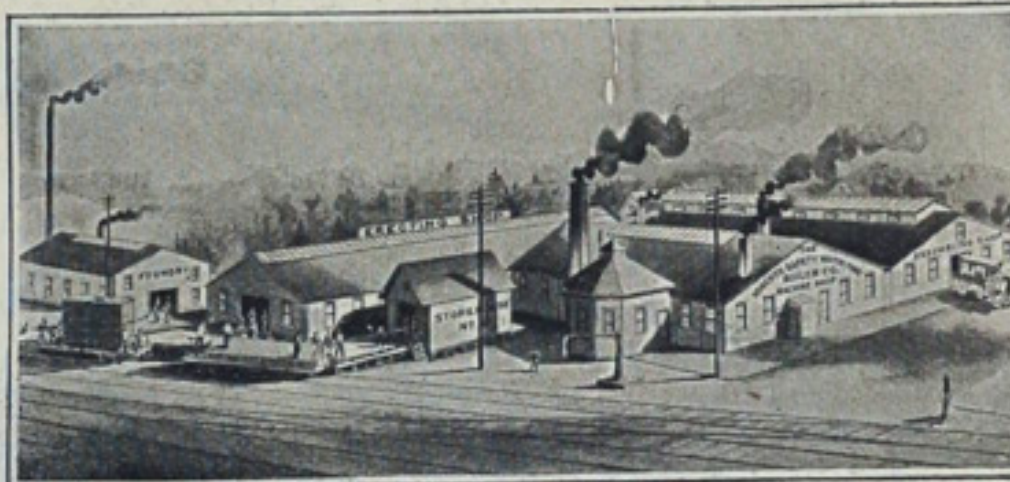
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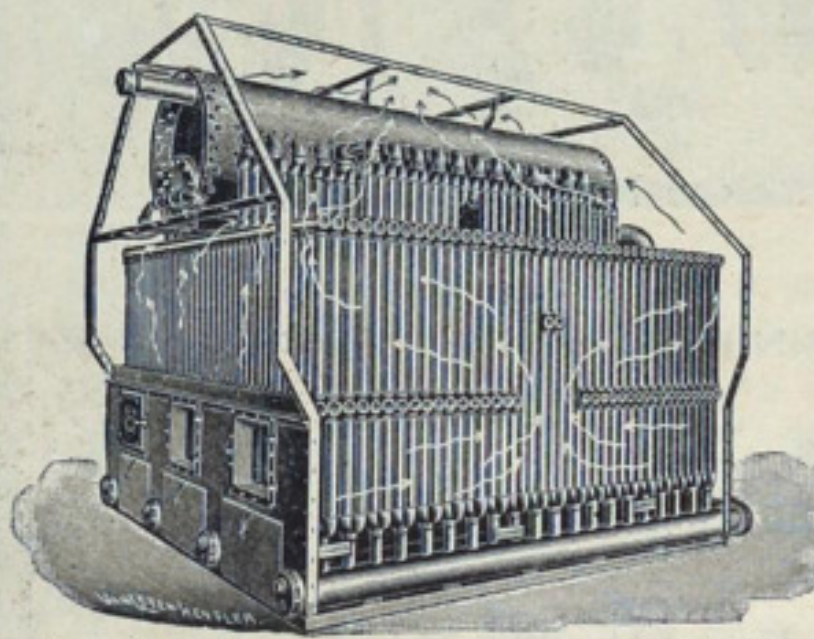
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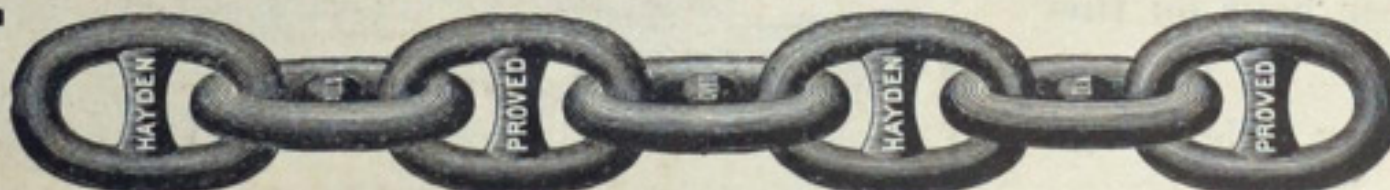
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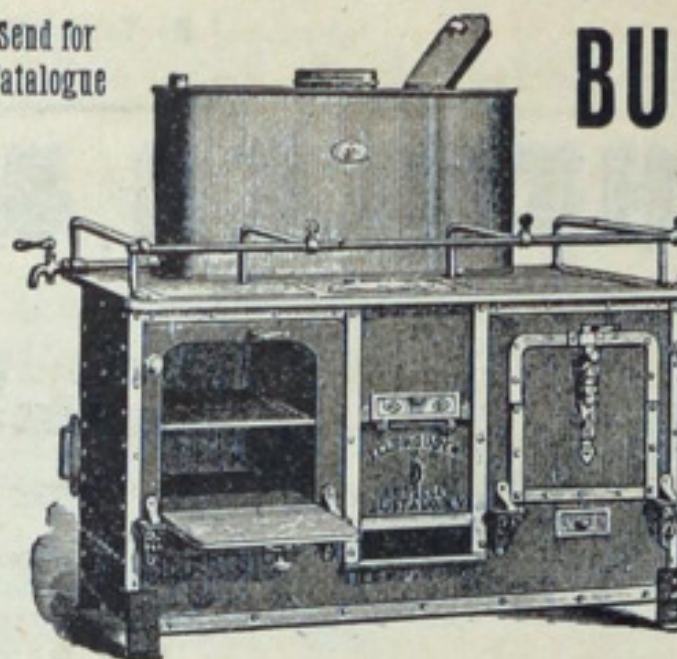
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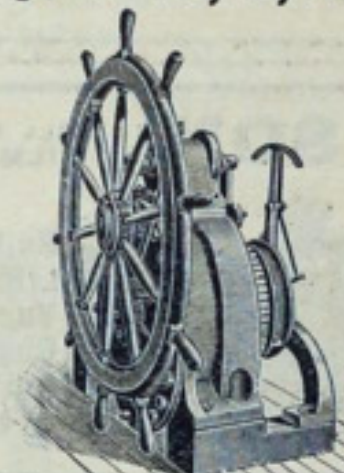
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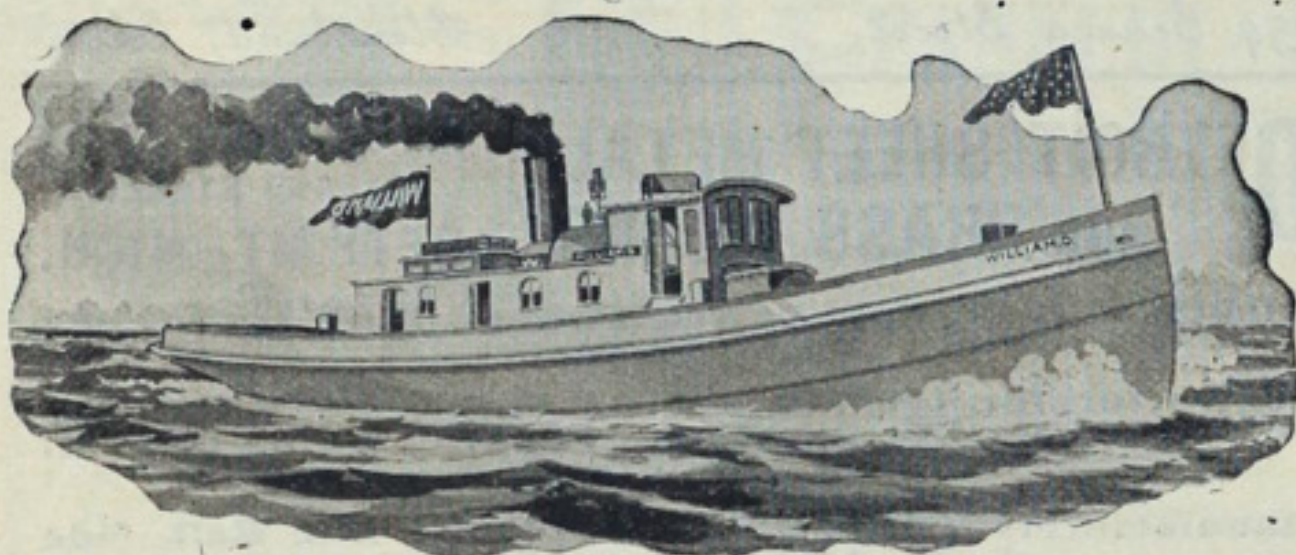
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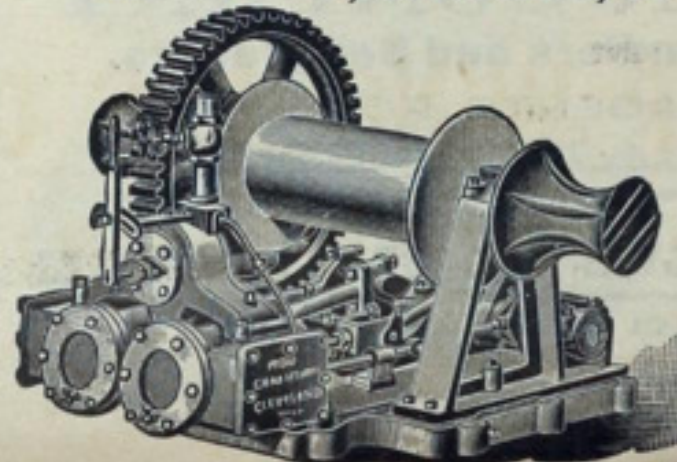
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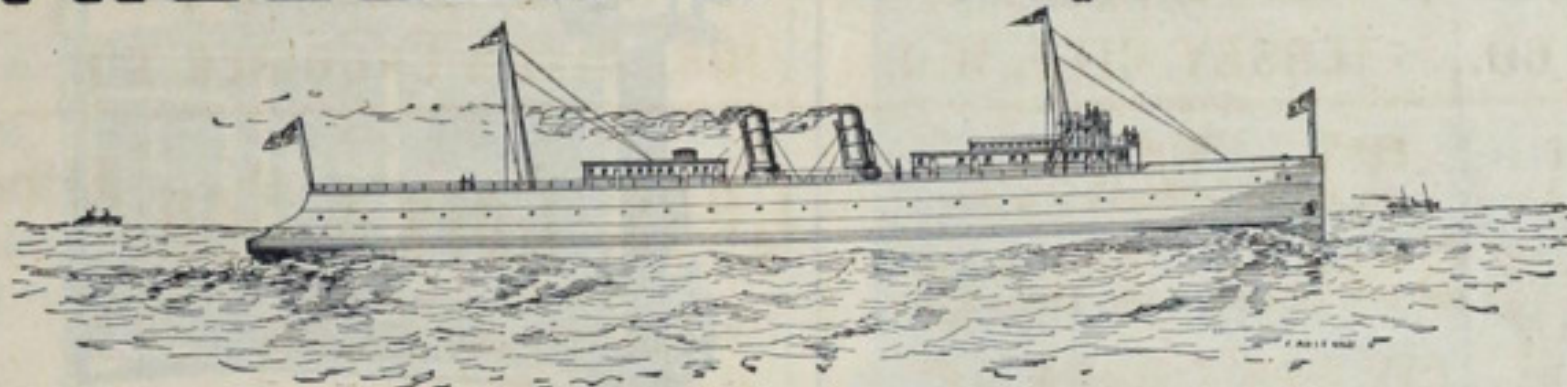
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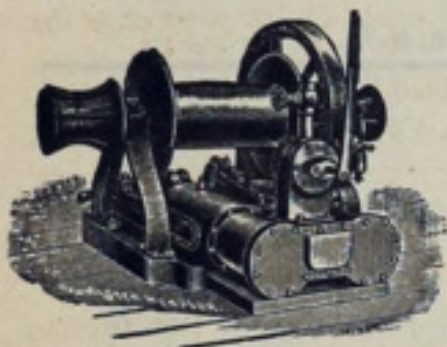
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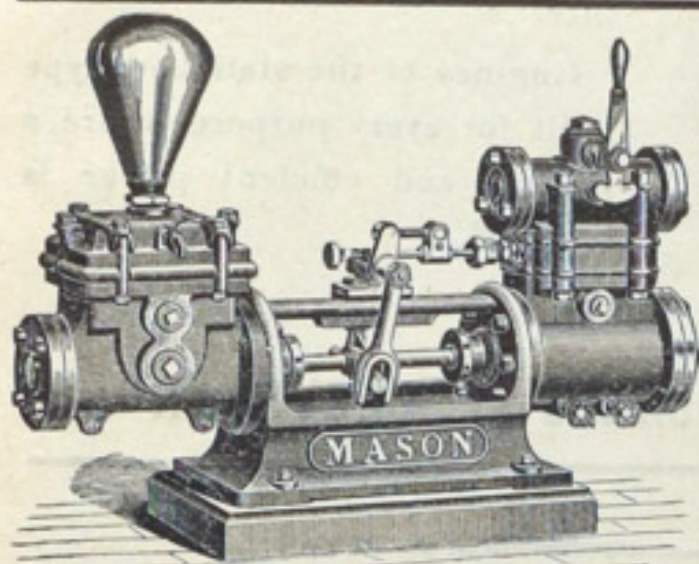
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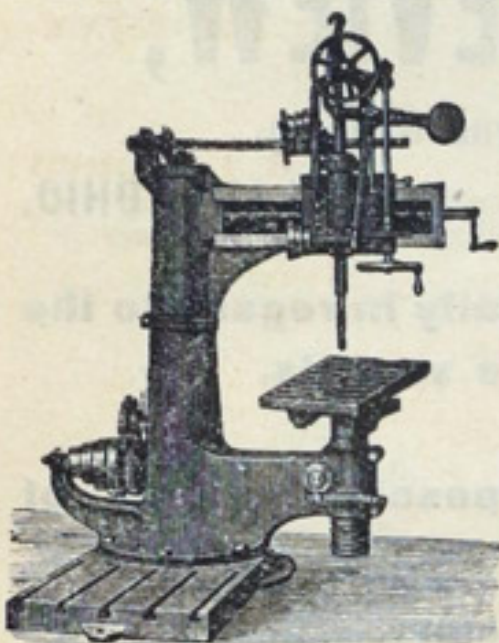
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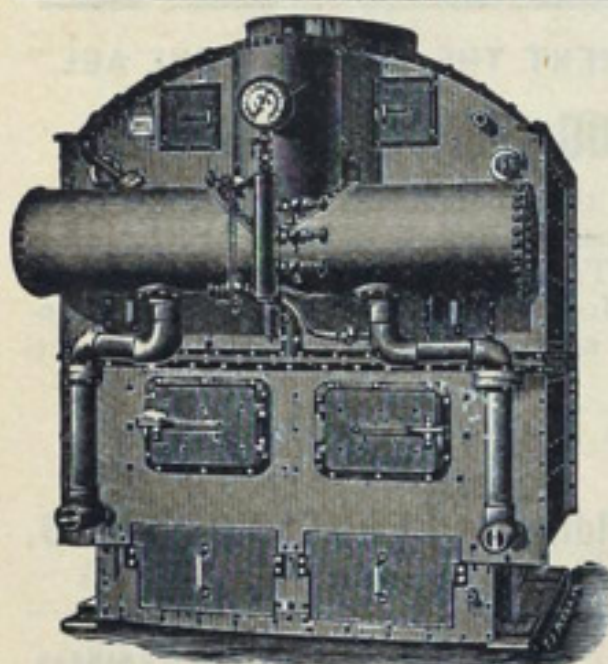
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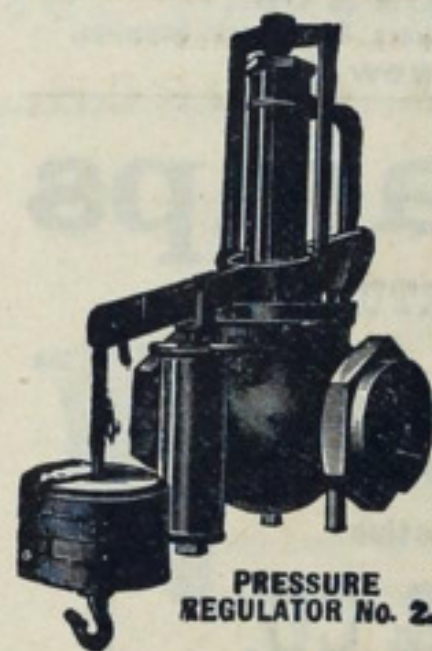
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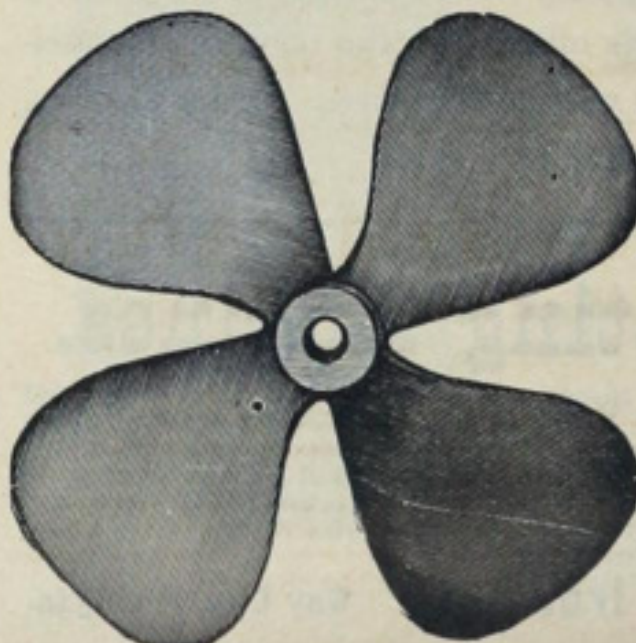
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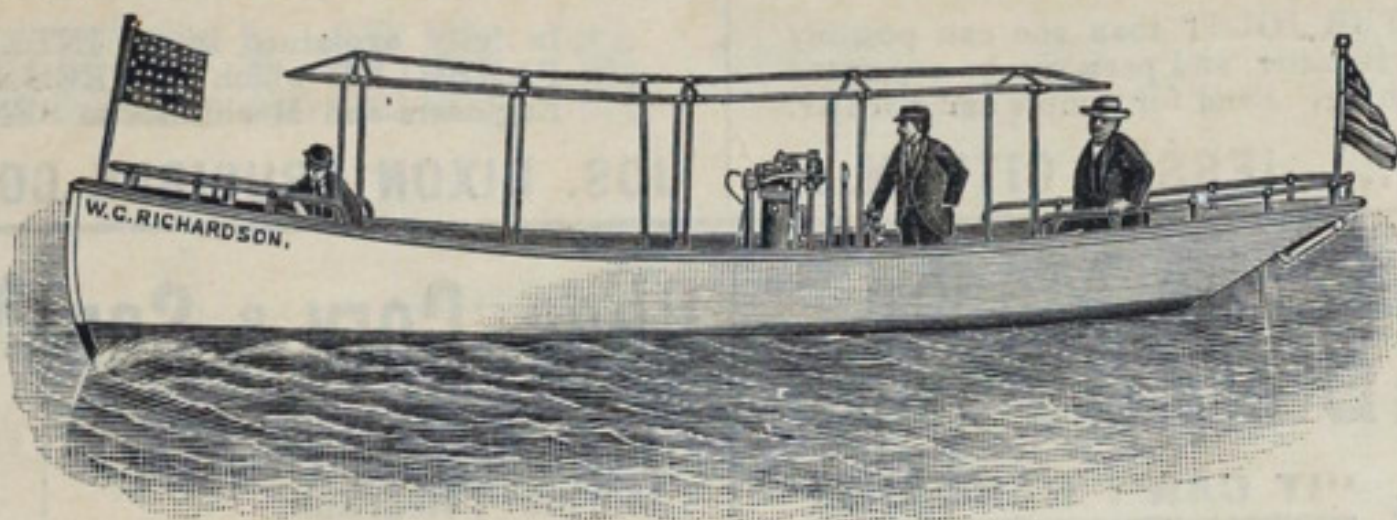
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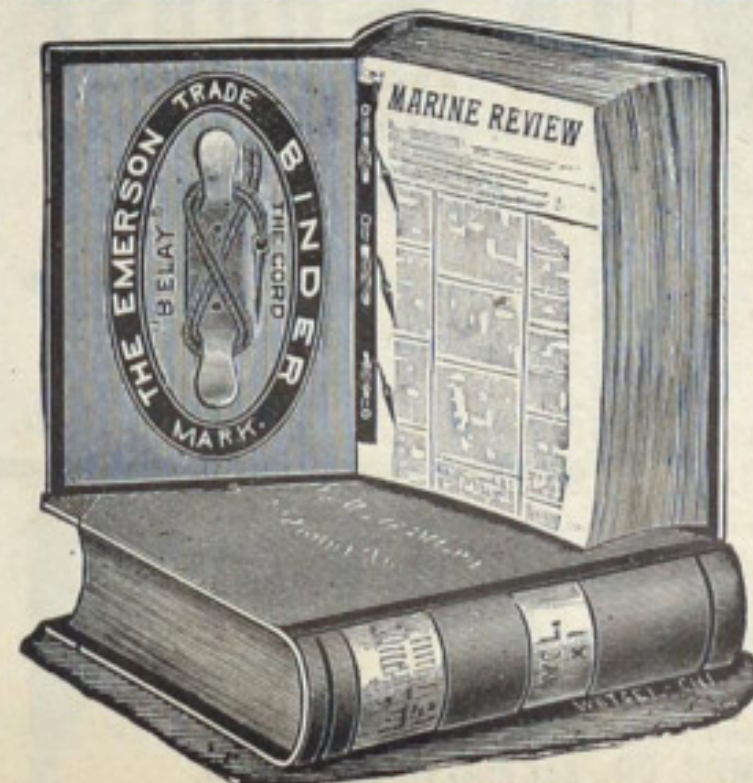


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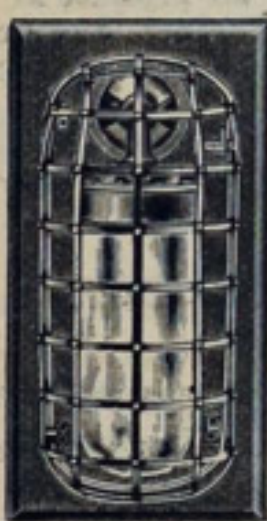
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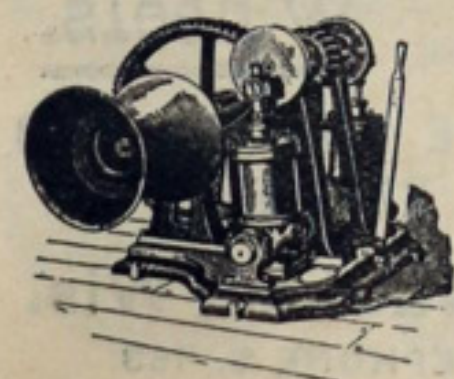
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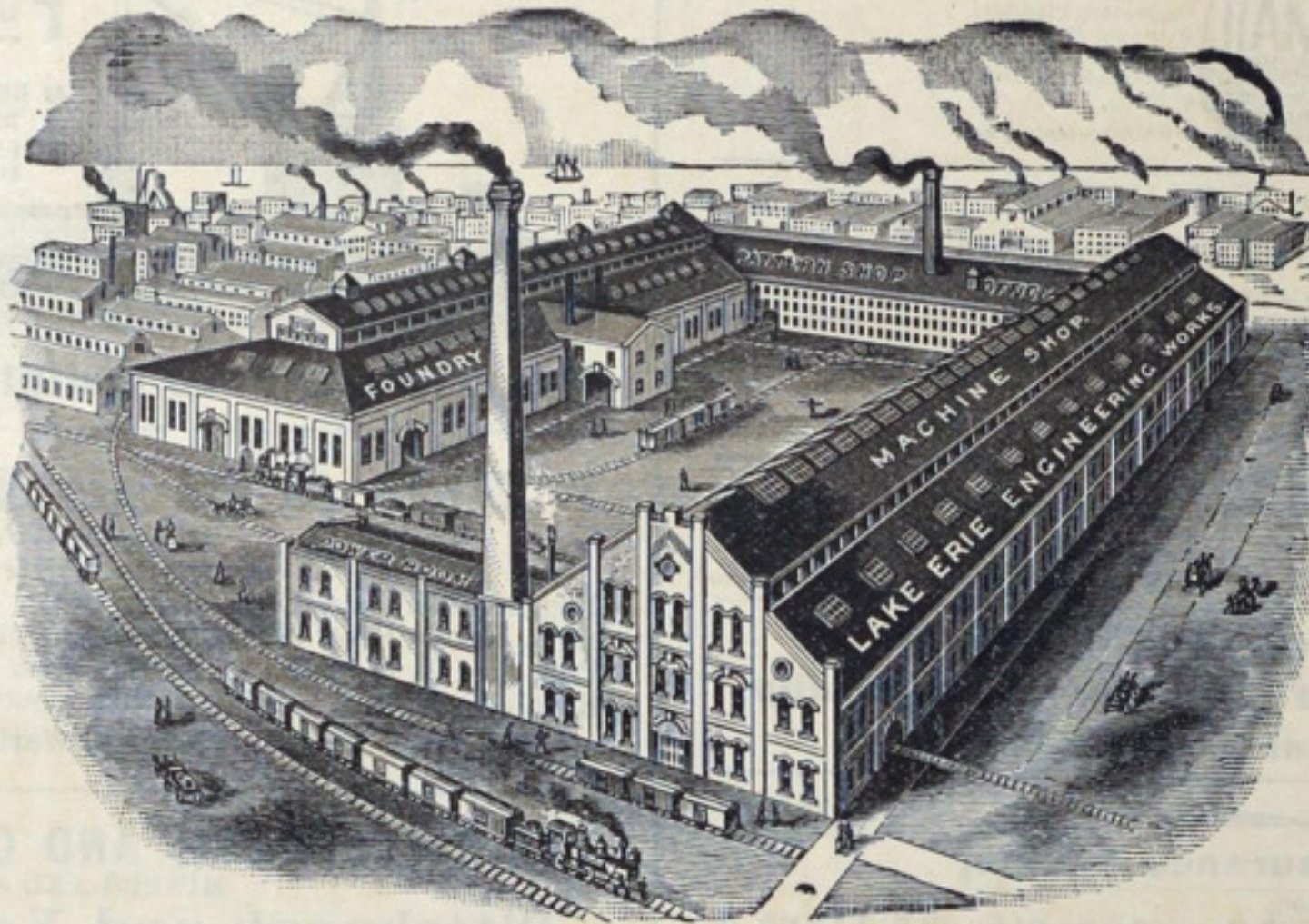
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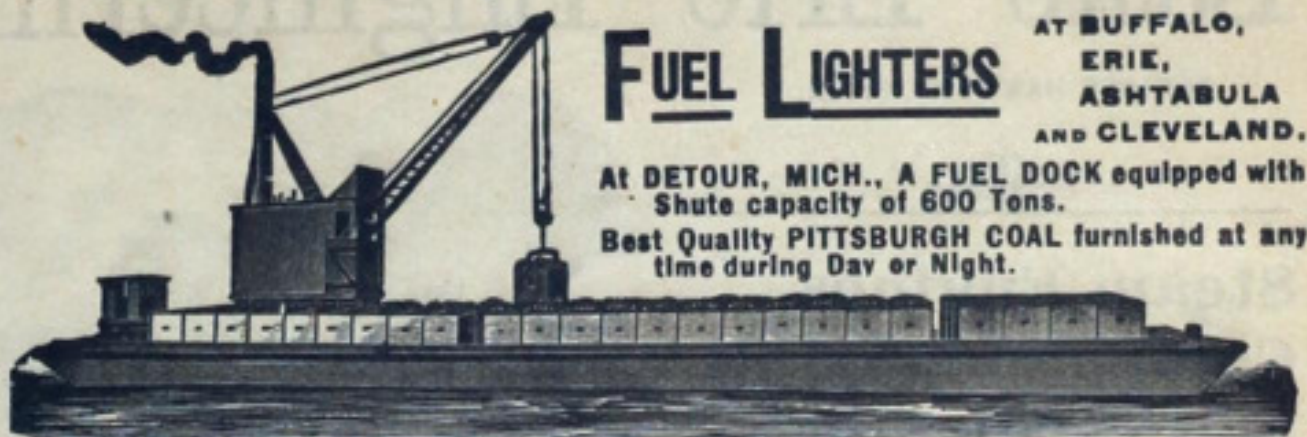
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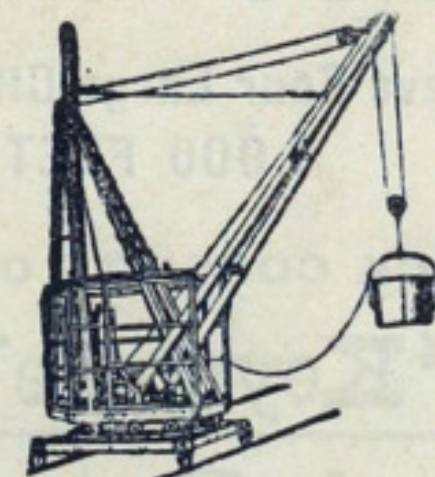
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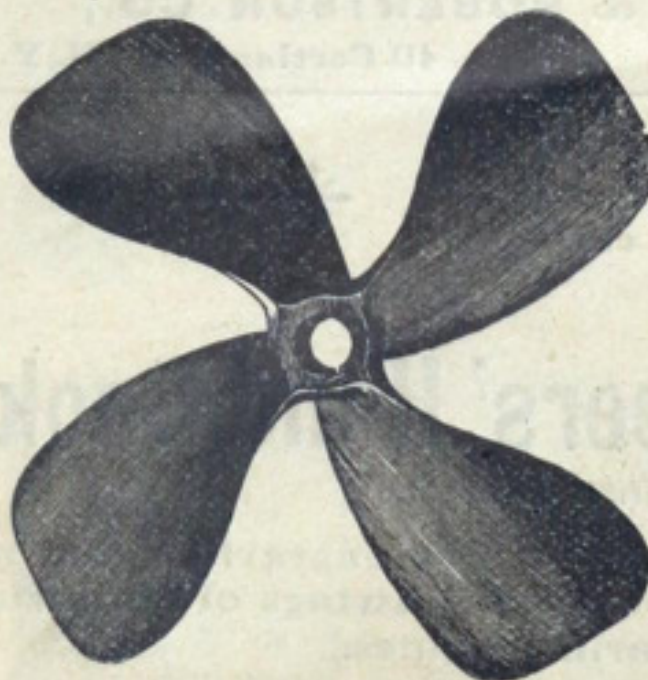
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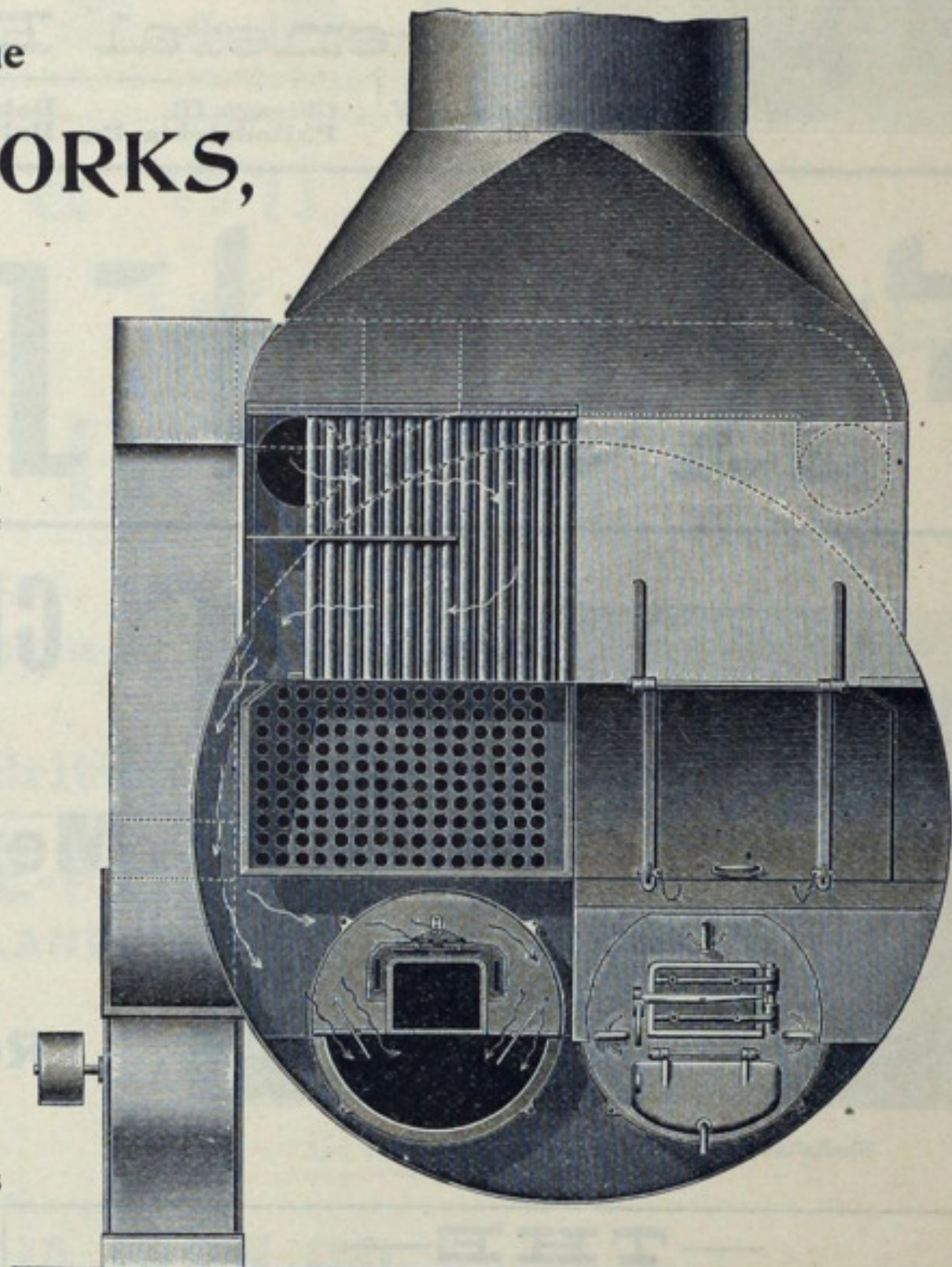
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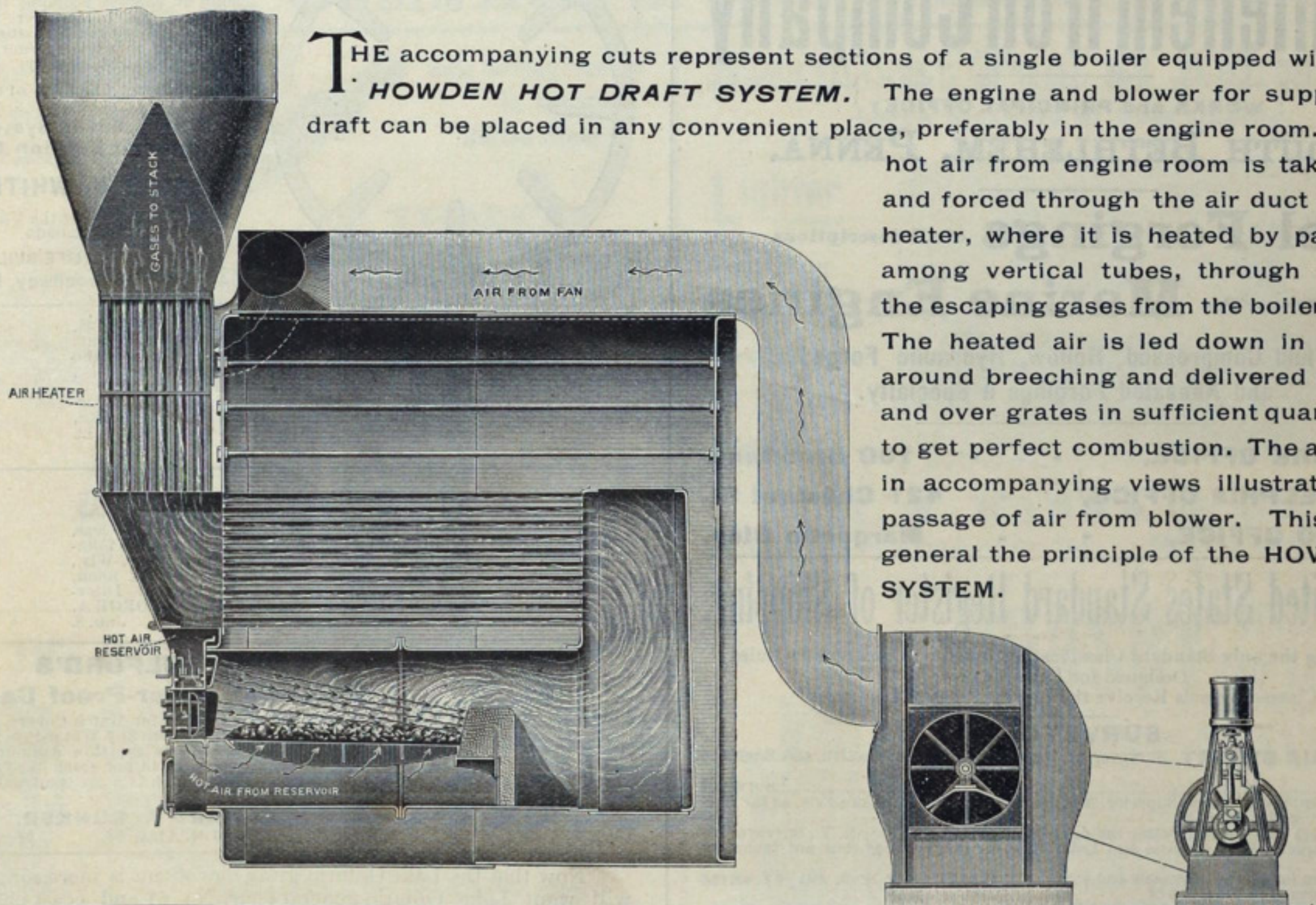
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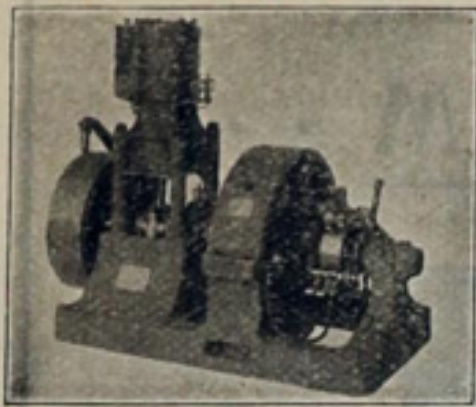
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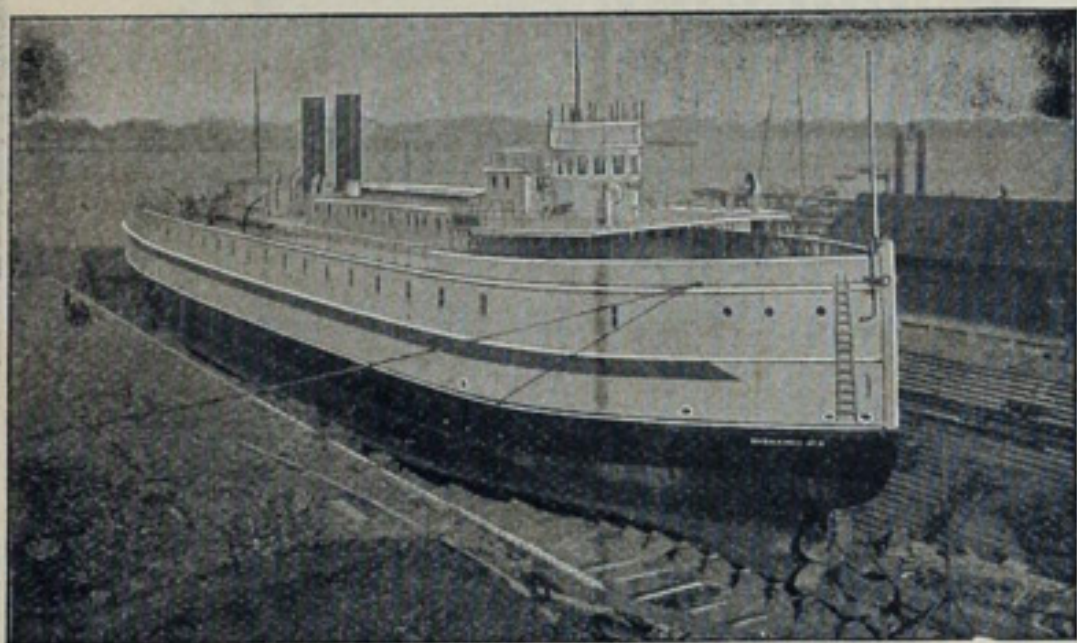
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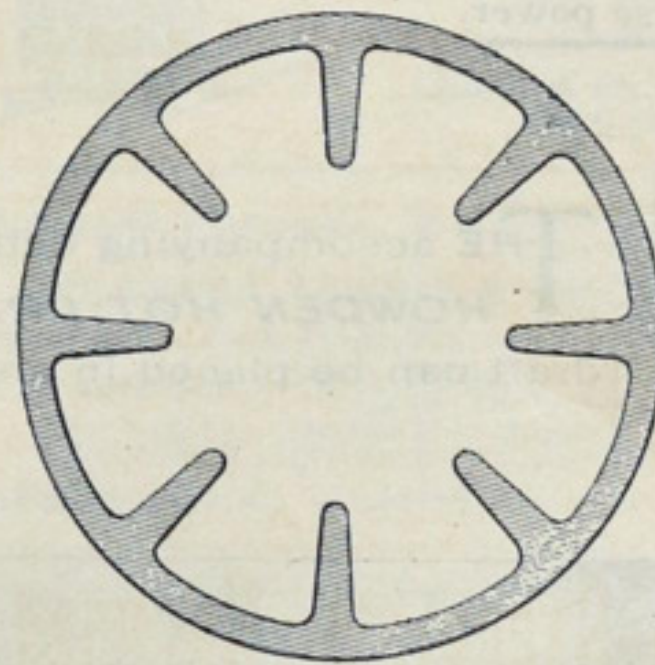
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Minn., Dec. 16, 1896. Sealed proposals for dredging about 21,000,000 cubic yards in the harbor of Duluth, Minn., and Superior, Wis., will be received here until noon, Feb. 15, 1897, and then publicly opened. Information furnished on application. **CLINTON B. SEARS,** Major, Engrs. Feb. 12.

U. S. ENGINEER OFFICE, 366 MILWAU-
kee, St., Milwaukee, Wis., Dec. 17, 1896. Sealed proposals for 1,600 feet, more or less, of Breakwater extension, cribs on stone foundation, at Harbor of Refuge, Milwaukee, Wis., will be received here until 12 o'clock noon, Jan. 9, 1897, and then publicly opened. Information furnished on application. **GEORGE A. ZINN,** Capt., Engrs. Jan. 8.



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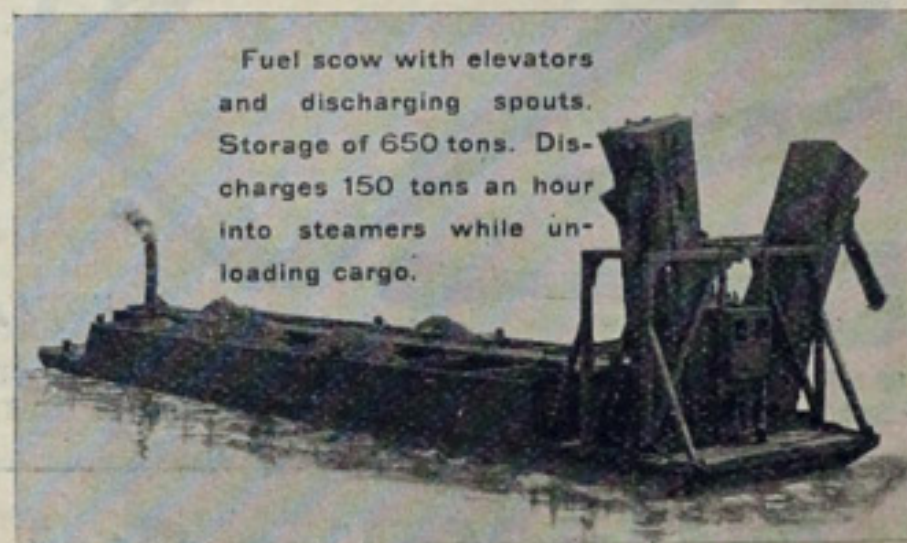
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U. S. ENGINEER OFFICE, Duluth, Minn.,
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licate, for building breakwater at Presque Isle
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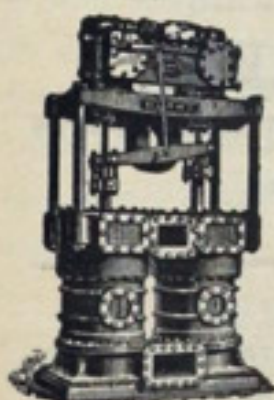
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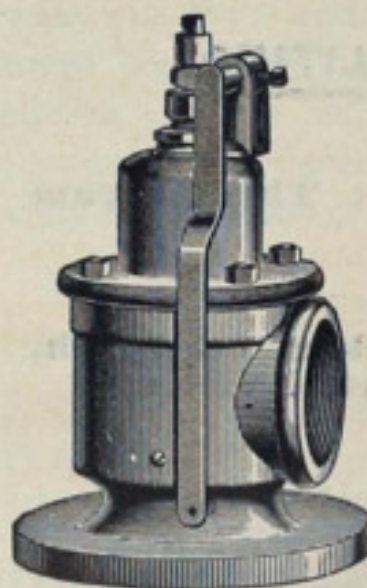
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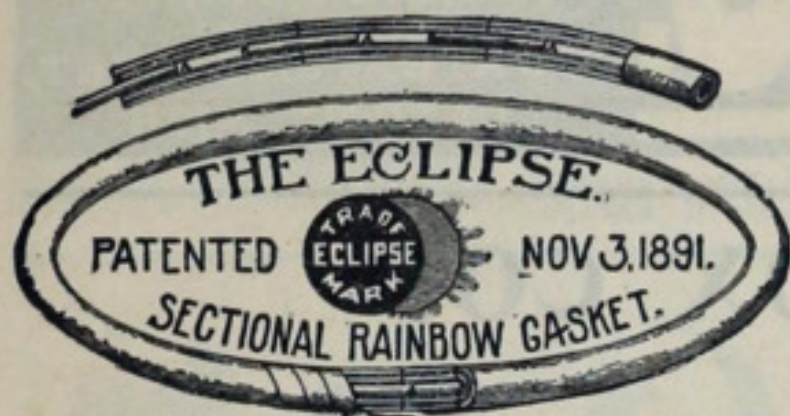
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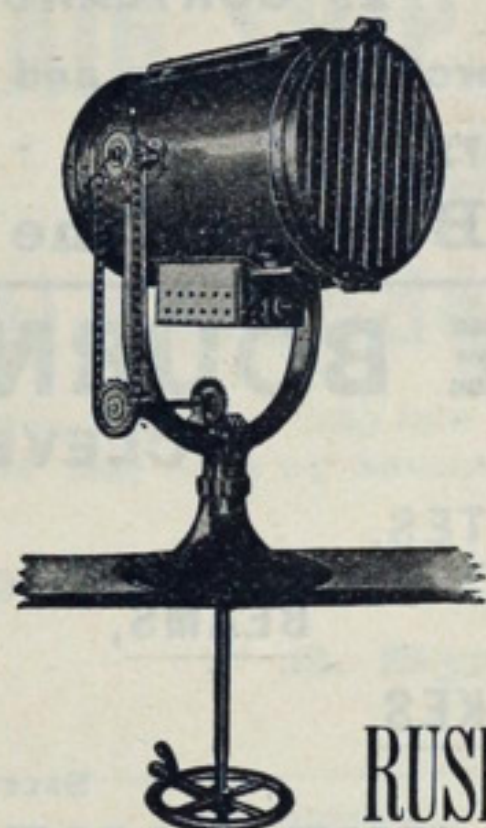
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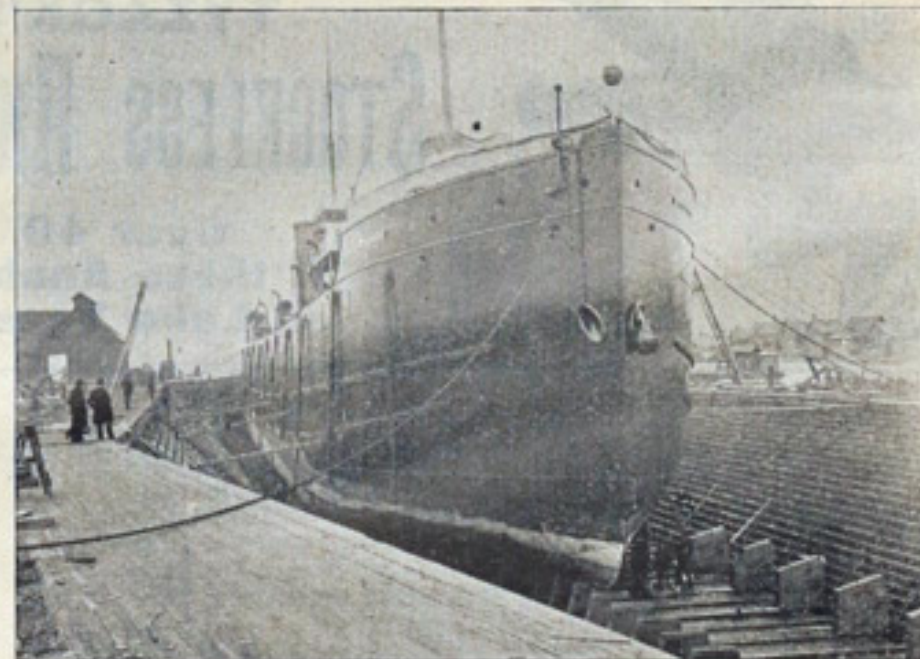
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